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NAVAL POSTGRADUATE SCHOOL

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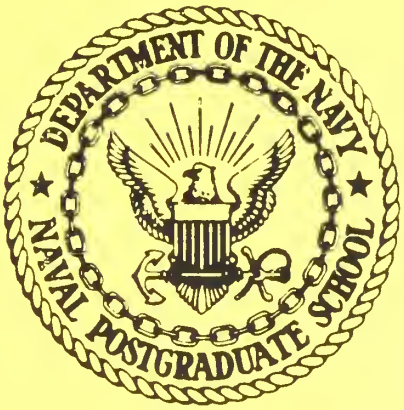

EVALUATION OF GRE DATA - AN EXPERIMENT AT NPS

Donald R. Barr
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AUGUST 1987

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EXECUTIVE SUMMARY

U.S. Naval Officers reporting to the Naval Postgraduate School as students during the period April 1986 to April 1989 are required to take the graduate record examination (GRE). An analysis of the GRE scores obtained to date and of other factors, such as age, sex, years since receiving a baccalaureate degree, and Academic Profile Code (APC) scores was performed. The analysis was based on data for approximately 320 students who have completed at least three quarters at NPS. Two measures of student academic performance were considered: graduate grade point average and total grade point average. The analyses performed are not exhaustive; other analyses could well provide further insights and other variables might be included in future analyses. Additionally, the sample size of tested students who have completed several quarters of work at NPS will grow.

Regression analysis was used to investigate which components of the GRE and APC scores (together with age and years since graduation) are important in predicting academic performance as measured by grade point averages (GPA's). In addition, several multivariate analysis methods were used in an attempt to find predictors of marginal academic performance (GPA's less than 3.0). The major conclusions are:

- Use of GRE's, in addition to APC's and other available indicators, can provide significantly better prediction of academic performance than use of APC's only.
- The VERBAL and QUANT portions of the GRE are most useful in predicting academic performance at NPS. These together with the first component of APC (which reflects overall past academic performance) and AGE are the best available predictors of GPA's.
- The second and third components of APC scores which reflect mathematical background and technical background are not useful predictors of academic performance of students admitted to NPS. Nevertheless, these components of APC remain important criteria for admission.
- Significant differences in GPA's and predictors of GPA's are evident over the various curricula at NPS.
- Discrimination of NPS students who will experience academic difficulties (GPA's less than 3.0), on the basis of combination of the predictor variables, appears difficult.

It should be noted that results of the experiment on GRE's are somewhat difficult to interpret because the GRE scores are obtained only for U.S. Navy students who were accepted by NPS.

Further analysis work with the GRE data, possibly in the form an NPS thesis project, is justified.

I. INTRODUCTION

Every academic institution is concerned with monitoring and controlling the quality of its incoming students. The Naval Postgraduate School, while it has characteristics not shared by civilian universities, is no exception. The Navy's interests are best served by selecting for advanced education only those candidates who are well-prepared and most likely to benefit from the opportunity. To withdraw the officer from his or her operational duties for assignment to graduate school is a significant decision both for the Navy and for the officer. This report considers data from an on-going experiment at NPS, the purpose of which is to determine the value of using the Graduate Record Exam (GRE) in the selection process.

Under the current admission system no reliable benchmark of academic performance is available which allows comparison between officers except in the most general terms. The candidate's academic records are available and these are translated into the Academic Profile Code. The APC is a three-digit code which reflects overall academic performance, mathematical background, and scientific and technical background. It is an important element of the selection process but is clearly not able to measure all elements of an officer's preparation for graduate school. The officer's records span a wide variety of institutions and subject areas and reflect a broad range of grade point averages. Some officers have continued their education by

night school, by correspondence, or by self study courses and the value of these is difficult to assess. Thus, the need for additional means of comparing candidates was sought.

The idea of using the GRE in the NPS selection process has been discussed for several years, but serious consideration began in about 1984. Numerous issues have delayed implementation. Would the exams be required or recommended? How will candidates (who may be on-board a ship or submarine) take the exam? Who will pay for the exam? What use will be made of the scores? Are the scores a reliable measure of future success in graduate school? Some of these questions remain unanswered, but it was decided in 1985 that a 3-year experiment would be conducted and all Navy students who entered NPS after March 1986 would take the GRE at NPS. The purpose of this was to collect data which could be used to address the substantitive questions regarding the value of the GRE for the purpose of selecting students.

It was originally proposed that the GRE be taken by all new Navy officer accessions. Undergraduates planning to accept a commission in the Navy would be required to take the GRE exam near the time of graduation. These scores would then be included in the officers' records and would be available later in the event that advanced education was considered. While the cost of implementing this proposal, for approximately 7000 new officers per year, would be about

$250k, this considerable cost would be offset or perhaps recovered entirely if the additional information prevented selecting for advanced education even a small number of officers who were not well-prepared. The three-year experiment was posed as a relatively low cost means to assess the value of the GRE results to the Naval Postgraduate School.

The process of selecting officers for advanced education is inherently difficult, but the time lapse between the baccalaureate degree and the selection for graduate school is an additional complication faced by the Navy in choosing students for masters level education. The original proposal, in which all new officers would take the GRE, had the desireable feature that the test would be taken near the time of graduation from their undergraduate program. One item meriting further investigation is the change in performance on GRE exams over time. For example, is the test a better measure of performance when taken near graduation? Does performance change significantly when the exam is delayed several years? Does this vary depending on the field of study? While some information on this subject exists, it was not available to the authors at the time this report was prepared.

One additional point of possible relevance in this study is the fact that the officer-students at NPS are highly motivated. Success or failure at NPS is directly related to success or failure in their ensuing careers. While this is

difficult to measure, the influence of this motivation should not be ignored in interpreting the results. What is sometimes lacking in academic background is often replaced by determination and hard work. Some of the difficulty in predicting which students might fail at NPS may be attributed to this factor.

This report describes the data used in the study, summarizes the analyses conducted, and discusses the results. The appendix contains detailed supporting tables. The analysis reported here was undertaken by the authors at the request of the Provost at NPS. While much has been done, more remains and subsequent analysis will no doubt refine some of the results presented here. There are many interesting questions which remain to be pursued and work is continuing on the analysis of the data.

II. DATA

Data records containing 575 Graduate Record Exam (GRE) scores and social security numbers (SSN's) were paired with records with corresponding SSN's in the Registrar's files. This resulted in approximately 550 records, some of which were incomplete (for example the academic profile code might be missing). Statistical Analysis System (SAS) programs were written to access the data file and to perform statistical analyses as described below. Checks were made on data fields as the data were read by the SAS programs. In most cases, records with missing fields were not included in the analyses.

After some preliminary investigation, it was decided to limit analysis involving grade point averages (GPA's) to data for students who had completed at least three academic quarters at NPS. The resulting database consisted of approximately 320 records. Two GPA's were considered: the total GPA, including all courses taken at NPS (TOTGPA), and the graduate GPA (GRADGPA), based only on 4000-level courses taken at NPS.

Table 1 shows summary statistics for the variables considered in our analyses. Table 1 is expanded by curriculum and included in Appendix 2 as Table 12.

VERBAL - verbal component of GRE score

QUANT - quantitative component of GRE score

ANAL - analytical component of GRE score

APC1 - first component of APC score (overall academic performance)

APC2 - second component of APC score (mathematical background)

APC3 - third component of APC score (science and technical background)

AGE - age of student (1987-year of birth)

DEGYRS - years since receipt of baccalaureate degree (1987-year of degree)

GRADGPA - graduate GPA

TOTGPA - total GPA

An important element of this analysis is the three character APC described above. Each digit represents one element of the student's academic background. The values of the digits in the APC range from 0 to 6. The smaller values indicate better preparation. Thus an APC of 000 is superior to 666.

TABLE 1
SUMMARY OF DATA ANALYZED

VARIABLE	N	MEAN	STD DEV	SUM	MINIMUM	MAXIMUM
VERBAL	317	546.151420	91.8361352	173130.000	300.000000	780.000000
QUANT	317	636.056782	86.1183131	201630.000	370.000000	800.000000
ANAL	317	588.706625	95.9820941	186620.000	260.000000	800.000000
APC1	317	1.965300	0.8976381	623.000	0	4.000000
APC2	317	2.277603	1.2033326	722.000	0	6.000000
APC3	317	3.135647	1.5843051	994.000	0	5.000000
AGE	315	31.723810	3.4377871	9993.000	26.000000	42.000000
DEGYRS	314	8.471338	2.9360827	2660.000	0	18.000000
GRADGPA	317	3.449968	0.3482729	1093.640	1.840000	4.000000
TOTGPA	317	3.443312	0.3783476	1091.530	1.000000	4.000000

Further description of the data elements and the contents of the records can be found in Appendix 1.

III. ANALYSIS

A. OVERVIEW OF ANALYSIS

The questions addressed by this analysis include:

- "How well can APC scores predict success at NPS?",
- "How well can GRE scores predict success at NPS?",
- "Do APC and GRE scores measure the same attributes of success potential?",
- "What would be the amount of improvement in predictions of student GPA's if GRE's were used to augment APC's?", and
- "How should APC and GRE scores be used jointly for applicant screening?"

Regression analysis was used to answer several of these questions, where "success" was measured by TOTGPA and GRADGPA after at least three quarters at NPS.

Stepwise regressions were performed to provide insight into the importance of the candidate carriers in predicting GPA's. Significant differences in GPA's were observed among curricula, and the ability to predict GPA's by curriculum was investigated for curricula having sufficient data.

Principal component analysis was used on the independent variables to determine if there were significant "factor scores" accounting for the total variability in the independent variables when considered as a multivariate set. Discriminant analysis was also conducted with respect to students achieving GPA's below 3.0 (roughly 10% of the total cases), in an attempt to see which scores were useful in predicting marginal academic performance.

Results of these analyses are described in the next section. Details and computer output are shown in Appendix 2.

It should be noted that only U.S. Navy officers with sufficiently "good" APC scores, and other indicators, to gain acceptance to NPS contributed GRE and APC data to this study. Thus, technically, all of these results are conditional on acceptance to NPS. It is believed that this does not pose a serious problem.

B. ANALYSIS RESULTS

1. Correlation

It is common in studies of student success prediction to find that the correlations of GPA's with the potential predictor variables are generally quite low. Table A1 in Appendix 2 shows the correlations among the major variables in our study. It can be seen that there are relatively strong correlations among the GRE variables, and that APC2 and APC3 are relatively strongly correlated. In general, both GRADGPA and TOTGPA show modest correlations (in the range .2 to .4 in absolute value) with all of the predictors variables except APC2, APC3 and DEGYRS. As an example, graphical depiction of the relationship between VERBAL and APC1 is shown in the scatterplot in Figure 1. It is apparent that, even though the correlation (-.21) is highly significant ($\alpha < .001$), the relationship is very imprecise.

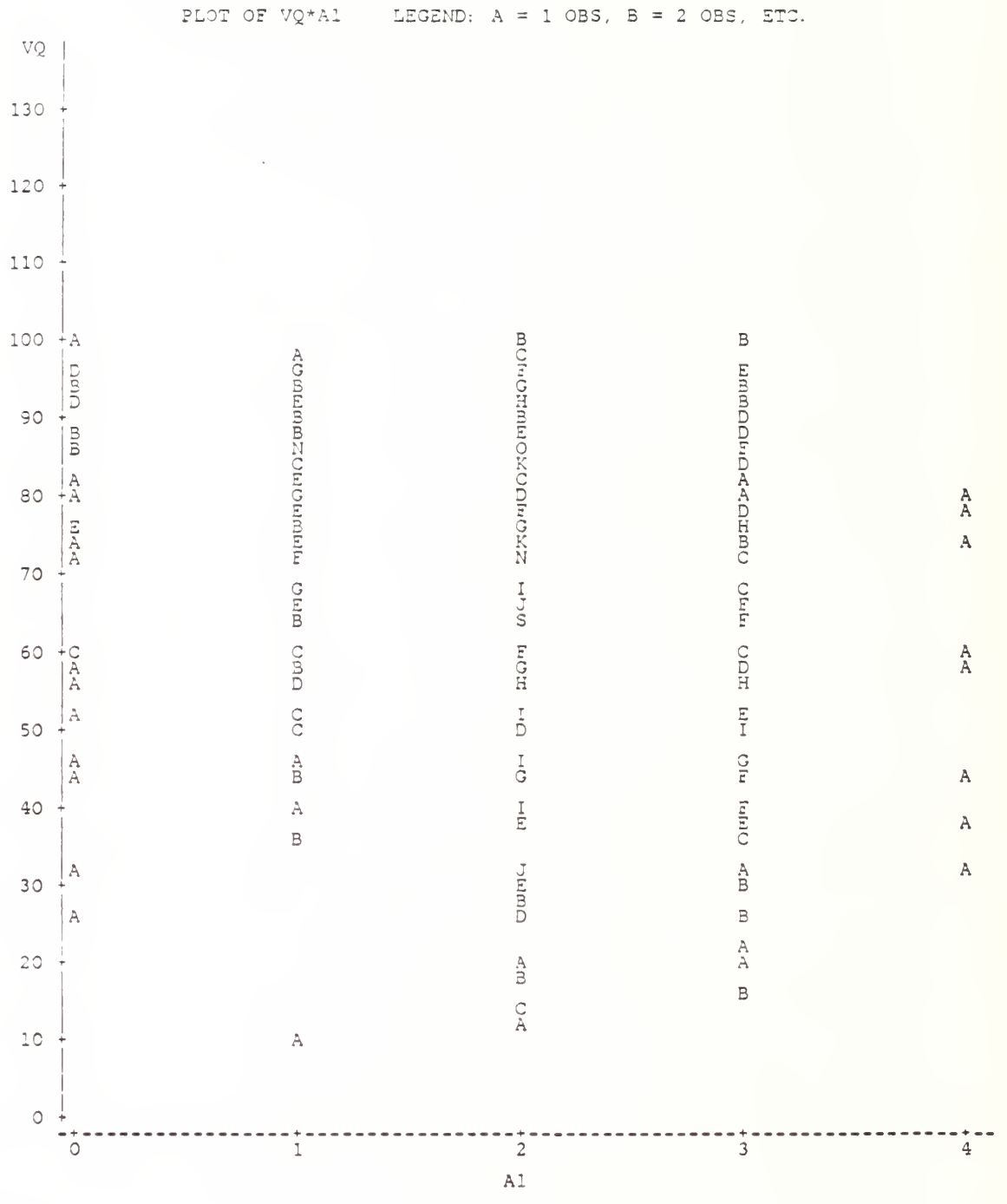

Figure 1. Scatter Plot of VERBAL Quantile Versus APC1.

The pattern of correlation in Table A1 of Appendix 2 suggests that useful relationships among the variables could be found through other analyses. These are discussed below.

2. Regression

Regressions of GPA's on three sets of carriers were performed. The first set had only APC scores (plus AGE and DEGYRS) as carriers; the second had only GRE scores, AGE and DEGYRS as carriers; the third had the union of the carriers in the first two sets. The results are summarized in Table 2 below, and output is shown in Table A2 in Appendix 2. It can be seen, in terms of R2 (the fraction of the total variability in the GPA's explained by the regression model), that the set of GRE's alone can predict GPA somewhat better than can the APC's alone. In the former case, VERBAL and QUANT are the most important carriers, while in the latter case APC1 is the most important carrier.

TABLE 2
SUMMARY OF REGRESSIONS WITH THREE SETS OF CARRIERS

	R2	VERBAL	QUANT	ANAL	AGE	DEGYRS	APC1	APC2	APC3
Regression without APC's									
a. GRADGPA	.23	**	**		*		N/A	N/A	N/A
b. TOTGPA	.17	**	*	*			N/A	N/A	N/A
Regression without GRE's									
c. GRADGPA	.15	N/A	N/A	N/A	**		**		*
d. TOTGPA	.11	N/A	N/A	N/A	*		**		
Regression with all Carriers									
e. GRADGPA	.26	**	**		**		**		
f. TOTGPA	.21	**		*.			**		

'**' denotes "very significant" ($\alpha < .001$); '*' denotes "significant ($\alpha < .05$);
R2 is the coefficient of determination.

In the regression with all carriers (GRE's, APC's, AGE and DEGYRS), the carriers that are most important for predicting GRADGPA are VERBAL, QUANT, AGE and APC1. For TOTGPA, the most important carriers are VERBAL, ANAL and APC1. It thus appears that use of GRE's in addition to APC's can improve the prediction of success at NPS; it is interesting to note that APC2 and APC3 are not significant carriers when GRE's are also used.

To further investigate the "importance" of potential carriers in the combined set, for predicting GPA's, stepwise regression was performed for GRADGPA and TOTGPA. The results are summarized in the top rows of Table 3 and output is shown in Table A3 in Appendix 2. The orders of entry of variables in the stepwise regressions indicate that VERBAL and QUANT are the most important carriers, followed by APC1. The results of the stepwise regression are generally consistent with the ordinary regression results shown in Table 2. Differences are due to the way in which sums of squares were computed in the two analyses.

It is interesting to note that, in a stepwise regression with data from only female students (n = 43), for prediction of GRADGPA, only the carrier APC3 was selected. No explanation of this evident, but it suggests that further analysis might be warranted.

Diagnostic checks were performed with the regressions, to assess whether non-compliance with the major model assumptions appeared to be serious. These included

TABLE 3

SUMMARY OF RESULTS FROM STEPWISE REGRESSIONS FOR ALL DATA AND CURRICULA FOR WHICH SAMPLE SIZE N WAS AT LEAST 10. NUMBERS IN EACH ROW INDICATE THE ORDER OF ENTRY OF THE VARIABLES, SHOWING "IMPORTANCE" OF THE CARRIERS IN PREDICTING GPA'S

	R2	N	VERBAL	QUANT	ANAL	AGE	DEGYRS	APC1	APC2	APC3
ERALL DATA										
GRADGPA	.26	312	1	2		4		3		
TOTGPA	.21	312	1	2	3			4		
rriculum 360										
GRADGPA	.51	25	1	2						
TOTGPA	.38	25	1	2					3	
rriculum 366										
GRADGPA	.78	16	1	2		4		3		
TOTGPA	.56	16		1						
rriculum 367										
GRADGPA	.21	27		1					2	
TOTGPA	.22	27	1			2				
rriculum 368										
GRADGPA	.74	14	1							2
TOTGPA	.61	14	1							2
rriculum 373										
GRADGPA	.70	13		1	2					
TOTGPA	.56	13		1	2					
rriculum 525										
GRADGPA	.45	15						1		
TOTGPA	.47	15						1		
rriculum 530										
GRADGPA	.51	24		1		2				
TOTGPA	.64	24						1	2	

TABLE 3

SUMMARY OF RESULTS FROM STEPWISE REGRESSIONS FOR ALL DATA AND CURRICULA FOR WHICH SAMPLE SIZE N WAS AT LEAST 10. NUMBERS IN EACH ROW INDICATE THE ORDER OF ENTRY OF THE VARIABLES, SHOWING "IMPORTANCE" OF THE CARRIERS IN PREDICTING GPA'S

CONT'D

	R2	N	VERBAL	QUANT	ANAL	AGE	DEGYRS	APC1	APC2	APC3
Curriculum 570										
GRADGPA	.64	21		1						2
TOTGPA	.38	21		1						
Curriculum 590										
GRADGPA	.60	15	1					1		
TOTGPA	.69	15	1		2			3		
Curriculum 620										
GRADGPA	None Selected									
TOTGPA	.19	14						1		
Curriculum 827										
GRADGPA	.67	14	1	2						3
TOTGPA	.68	14	1	2						3
Curriculum 837										
GRADGPA	.81	17	1		2	4				3
TOTGPA	.78	17				2				1

plots of residuals versus predicted values, examination of the "Hat" matrix, and Cook's D and DF fits. These diagnostics provide checks on homogeneity of variance, systematic model error, "outliers", leverage points and influence points. The regressions reported here appeared to pass these checks.

Plots of residuals (observed GPA - predicted GPA) provide insight into how poor the regression prediction of an individual student's performance might be when using the regression predictor. Figures A1 through A6 in Appendix 2 show histograms of residuals for the six regressions summarized in Table 2. The histograms corresponding to the regressions with all carriers available (Figures A5 and A6 of Appendix 2) indicate that the fitted predictors would have over-predicted performance (negative residual) by .5 grade point units or more in TOTGPA and GRADGPA for about six percent of students admitted. This error rate is seven to eight percent when only GRE score or only APC scores are used. Under-prediction of performance by as much as .5 in GPA's occurred in about two to three percent of the cases.

3. Curricula Differences

An analysis of covariance was run for each of the response measures GRADGPA and TOTGPA, with curriculum (CURRIC) at 33 levels as the factor of interest, and with VERBAL, QUANT, ANAL, APC1, APC2, APC3, AGE and DEGYRS as covariates. The results are shown in Table A4 of Appendix 2. There are highly significant differences in mean GPA's

for the various curricula. Also, consistent with the regressions discussed above, the covariables VERBAL, QUANT, APC1 were significant (and also AGE for GRADGPA).

This covariance analysis suggests that the effects of the carriers in predicting GPA's might be different for the various curricula. Stepwise regressions with the combined set of carriers were run for those curricula having at least 10 students in the data set. The results are summarized in Table 3; output for the final step in each case is shown in Table A5 of Appendix 2. These results indicate substantial differences in the sets of carriers selected in the various curricula. These differences might be due to a combination of factors, including types of students who select certain curricula, grading practices in the curricula, selection policies by NPS, and departmental differences with respect to handling marginal or failing students.

Average scores on the various carriers vary considerably over curricula. For example, curriculum 590 has 15 students with average GRE's much higher than that for curriculum 360; students in curriculum 590 also have APC scores averaging much lower (better) than that for curriculum 360. The students in curriculum 590 are somewhat older but have been out of school for a shorter length of time than the students in curriculum 360. Averages of carrier values and GPA's for the various curricula are shown in Table A6 of Appendix 2.

4. Principal Component Analysis

Principal component analysis estimates "factors" which are linear combinations of the carrier variables such that the first (PRIN1) accounts for the maximal amount of variability among the carriers, the second (PRIN2) is orthogonal to the first and accounts for the maximal amount of the remaining variability, after removing the effect of PRIN1, and so on. The purpose of principal component analysis is to derive a small number of factors of a set of carriers that retain as much of the information in the original variables as possible. The analysis can also uncover approximate linear dependencies among the variables. The output is shown in Table A7 of Appendix 2.

The weighting placed on each carrier for the first three factors, shown at the bottom of Table A7, can be interpreted roughly as follows. PRIN1 is roughly the negative of the average of the carriers, with signs such that "big is good" for GRE's and "big is bad" for the other carriers. PRIN2 weighs VERBAL heavily and discounts QUANT and negates APC1 and ANAL. PRIN3 discounts VERBAL and QUANT and negates ANAL and DEGYRS. Note that the first three factors account for about 70% of the total variation. This does not provide a substantial reduction in the number of carriers for regression, since most of the regressions included only three or four carriers in the first place.

The overall conclusions from the principal component analysis are:

the GRE's and APC's are certainly not orthogonal measures;
the best overall representation of the combined set of carriers would be a properly signed average, as in PRIN1; and
no useful reduction in the set of possible carriers is afforded by the principal component analysis.

5. Discriminant Analysis

Canonical discriminant analysis is a dimension-reduction technique related to principal component analysis and canonical correlation. Given a classification variable and several carriers, the analysis derives several "canonical variables", which are linear combinations of the carriers, that summarize between-class variation.

We applied canonical discriminant analysis to a classification variable based on marginal academic performance. Specifically, we defined an indicator variable for each of the GPA variables as follows:

$$\text{GRADIND} = \begin{cases} 0 & \text{if GRADGPA} < 3.0 \\ 1 & \text{if GRADGPA} \geq 3.0 \end{cases}$$

$$\text{TOTIND} = \begin{cases} 0 & \text{if TOTGPA} < 3.0 \\ 1 & \text{if TOTGPA} \geq 3.0 \end{cases}$$

About 9% of the students had GRADGPA < 3.0 and about 7% had TOTGPA < 3.0.

The goal was to determine if one or two "optimal" linear combinations of the carrier variables could discriminate, on the basis of the carriers, which students would experience marginal academic performance at NPS (i.e.,

would have indicator values of 0). Results are shown in Table A8 in Appendix 2. It is interesting to note that ANAL is weighted heavily in the first canonical factor, CAN1, in predicting marginal performance, even though it was generally unimportant in predicting GPA.

The ability of CAN1 and CAN2 to discriminate between students with marginal and students with non-marginal performance, on the basis of corresponding weighted averages of the carriers, is shown graphically in Figures 2 and 3. These plots show that attempts to discriminate which students will experience academic difficulties will necessarily encounter high error rates, since the "0" and "1" points are intermixed in the figure.

Mean values of the carriers within levels of TOTIND and GRADIND are given in Table A9 in Appendix 2.

For a set of observations containing one or more quantitative variables and a classification variable defining groups of observations, discriminant analysis develops a model to classify each observation into one of the groups. We performed discriminant analysis with the classification variables TOTIND and GRADIND, using various threshold definitions for "academic difficulty". A summary of results from stepwise discriminant analyses with two threshold values, 3.2 and 3.0, are shown in Table 4. The interesting result in these analyses is the predominance of ANAL as a discriminator for marginal academic performance.

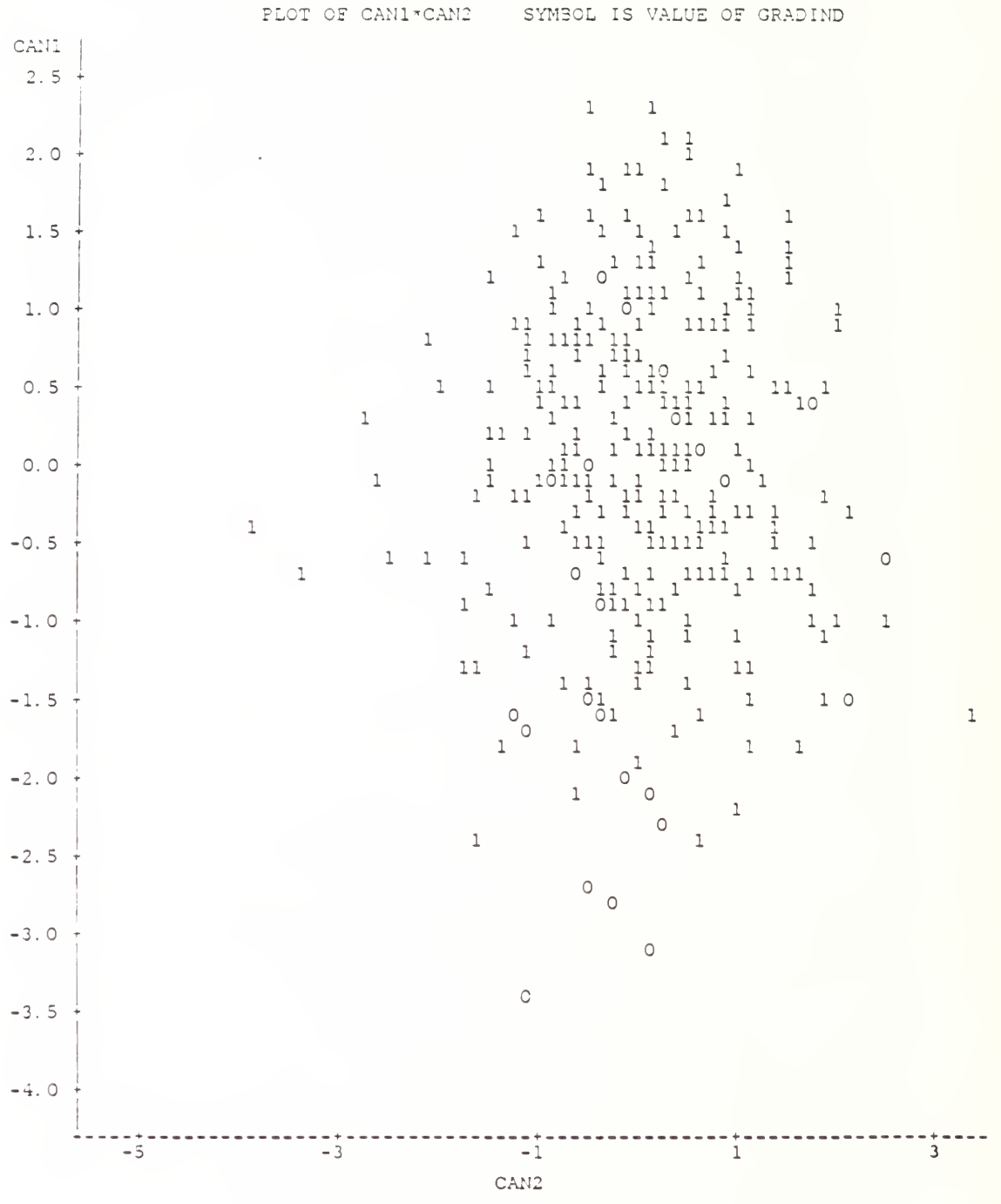

Figure 2. Plot of GRADIND Levels for Combinations of the Two Major Canonical Discriminant Factors.

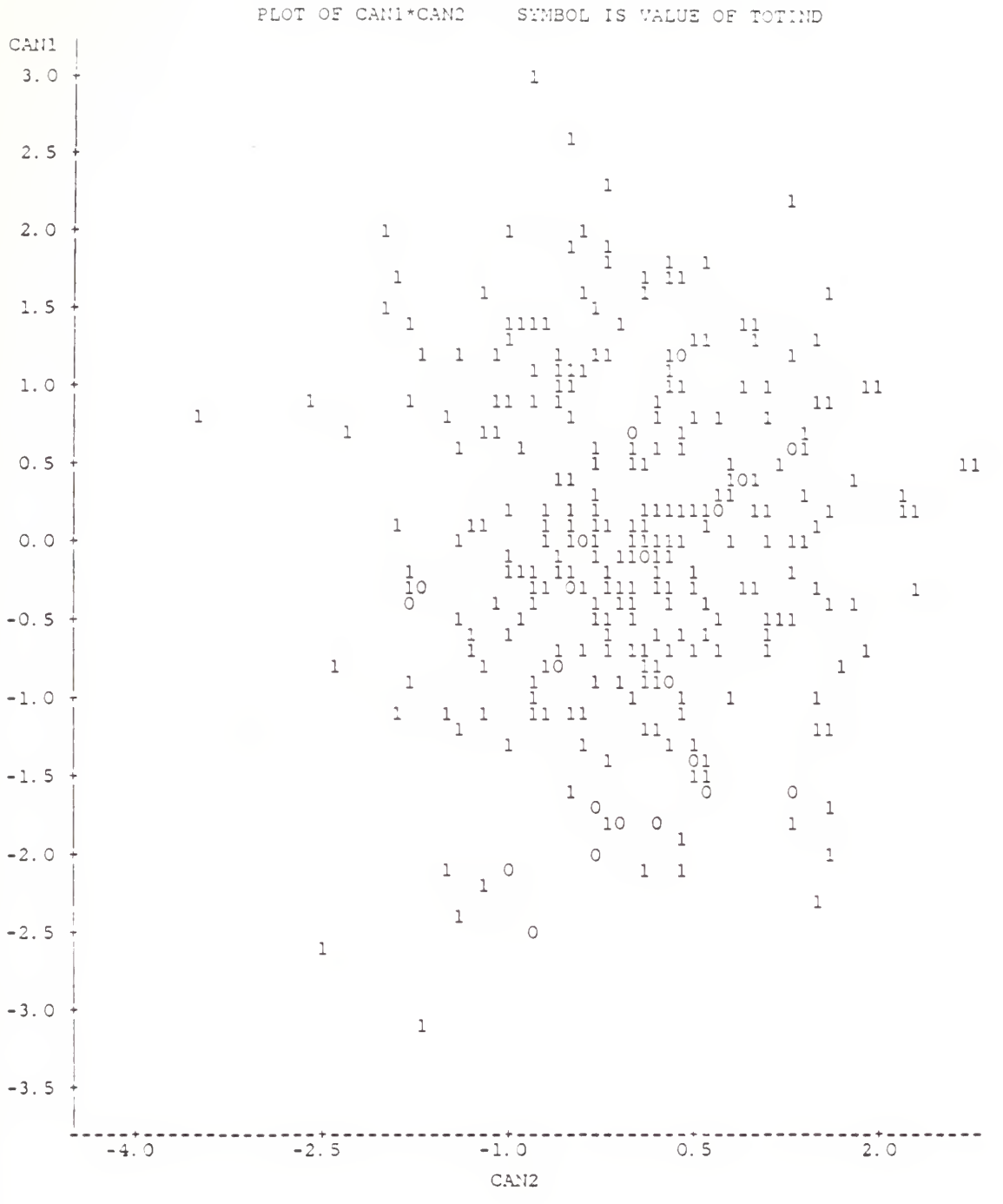

Figure 3. Plot of TOTIND Levels

TABLE 4
SUMMARY OF VARIABLES IN
STEPWISE DISCRIMINANT ANALYSIS

Response Variable	Threshold	Ratio IND=0:IND=1	Variables Selected
GRADGPA	3.0	26:286	ANAL AGE
TOTGPA	3.0	23:289	ANAL APC1
GRADGPA	3.2	69:243	QUANT ANAL AGE APC1 APC2
TOTGPA	3.2	49:263	ANAL APC1

This is in contrast with the regression based predictors of academic performance overall, where ANAL was not an important carrier.

Results of discriminant analyses using GPA threshold 3.0 and the major variables selected in the stepwise procedure, QUANT, ANAL, APC1 and AGE, are shown in Tables A10 and A11 of Appendix 2. The discriminant function is not successful in separating the two groups associated with GPA indicator values of "0" and "1", based on information in the carrier variables. As can be seen in Tables A10 and A11, there is considerable error in assignment of cases to the "0" group. For GRADIND, only 7

of the 27 "0 cases" were assigned to the "0 group"; for TOTIND, only 1 of the 23 "0 cases" was assigned to the "0 group".

Performance of the discriminant function can be modified somewhat by changing the threshold definition of the GPA indicator and the prior probabilities of "0" and "1". However, when using the available GRE and APC variables the error rates remain quite high in discriminating students having marginal academic performance, regardless of threshold and prior. It appears that prediction of which U.S. Navy officer students, among those admitted to NPS, will experience academic difficulty remains an elusive goal.

APPENDIX 1 - DATA

This section describes the data sources and the data elements used in creating the GRE database.

There are 575 GRE test results from five test dates

a. April 1986 - 75 items
b. August 1986 - 148 items
c. October 1986 - 140 items
d. February 1987 - 98 items
e. April 1987 - 114 items

The raw data from the GRE test scores consists of

- Name and address
- sex
- birthdate
- social security number
- institution (NPS)
- test date
- verbal score and percentile
- quantitative score and percentile
- analytical score and percentile

This data was received in printed form. The following items were manually entered into a file on the NPS mainframe computer:

a. social security - SSN
b. first three characters of last name - NAM
c. sex - SEX
d. test date - TDATE
e. verbal score - VERBAL
f. percentile - VPER

g. quantitative score - QUANT

h. percentile - QPER

i. analytic score - ANAL

j. percentile - APER

After entry this file was made available to programmer/analysts in the Academic Administration department who used the social security number to access records of the Registrar and the Admissions Office. For each record obtained, the first three characters of the last name were used as a check to verify that the records were for the same individual. If the check failed or if the social security number was not found, the records were not included in the final database. Approximately 543 records were accepted.

For those records where the social security number and the three character code matched, the data below was obtained from or computed from the Registrar's (or Admissions Office) records and combined with the GRE data. For some records certain data elements are missing or obviously erroneous. Preliminary analysis was conducted to eliminate records with serious errors.

k. Birthdate - BDATE

l. Academic Profile Code - APC

m. Degree Date (previous degree) - DDATE

n. Degree (coded degree type) - DEG

o. NPS Curriculum number - CURR

p. NPS entry date - ENTRY

q. Number of quarters completed at NPS - N

r. QPR (graduate) by quarter - GRADGPA

s. QPR (total) by quarter - TOTGPA

To prevent misuse of the information, names and social security numbers do not appear in the final database being used for analysis.

APPENDIX 2 - SUPPORTING FIGURES AND TABLES

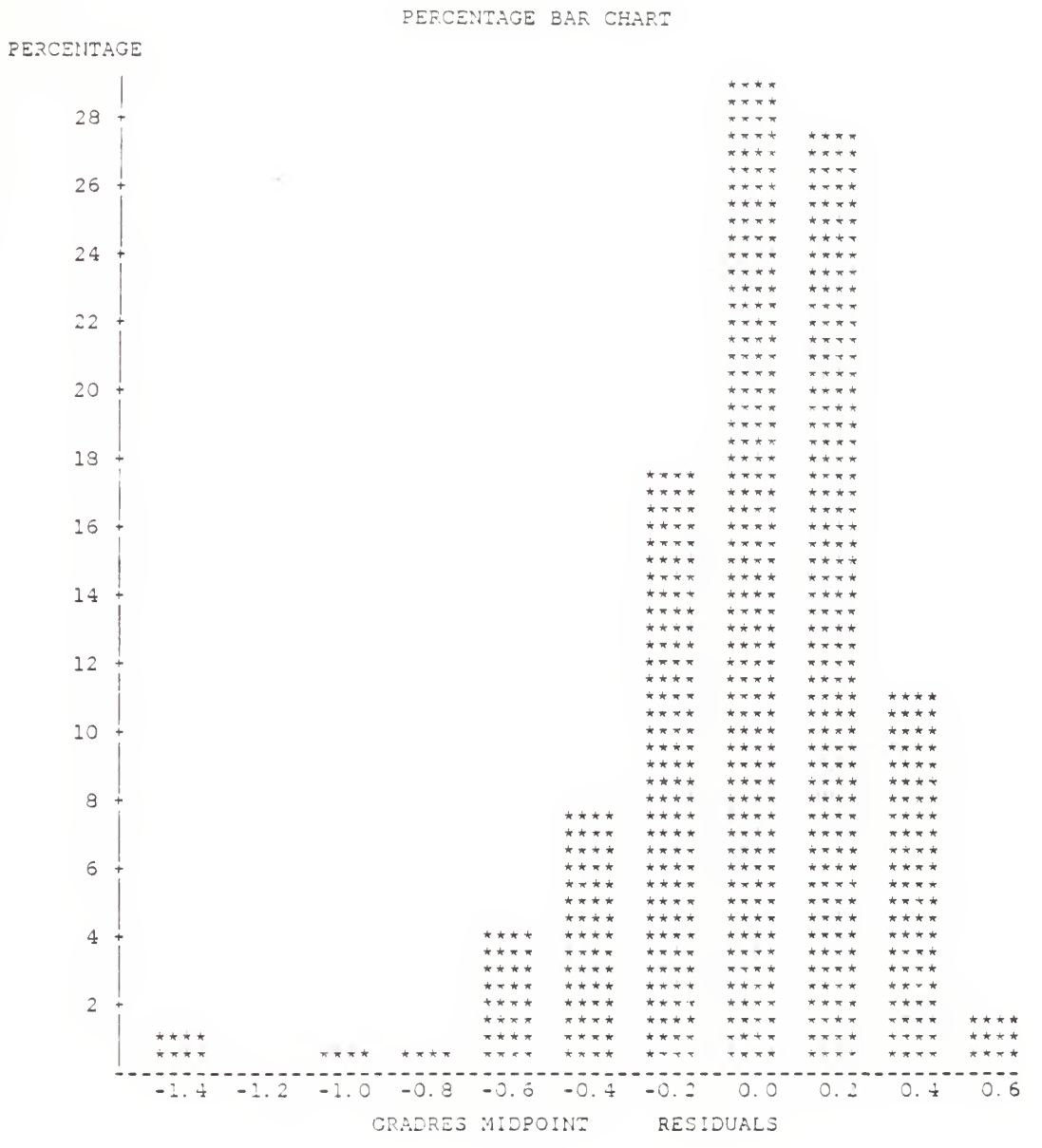

Figure A1. Histogram of Residuals for Regression of GRADGPA on GRE's and AGE.

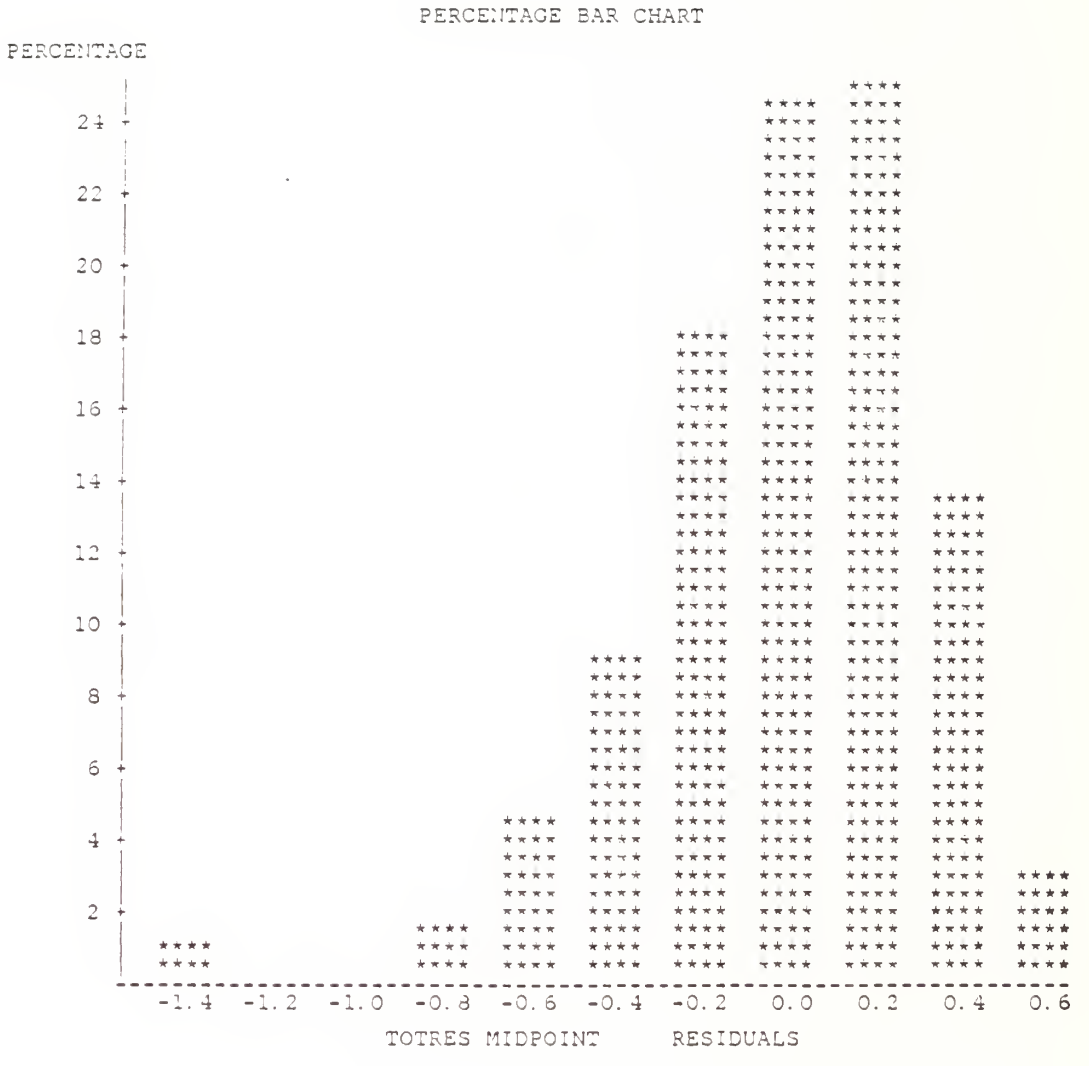

Figure A2. Histogram of Residuals for Regression of TOTGPA on GRE's and AGE.

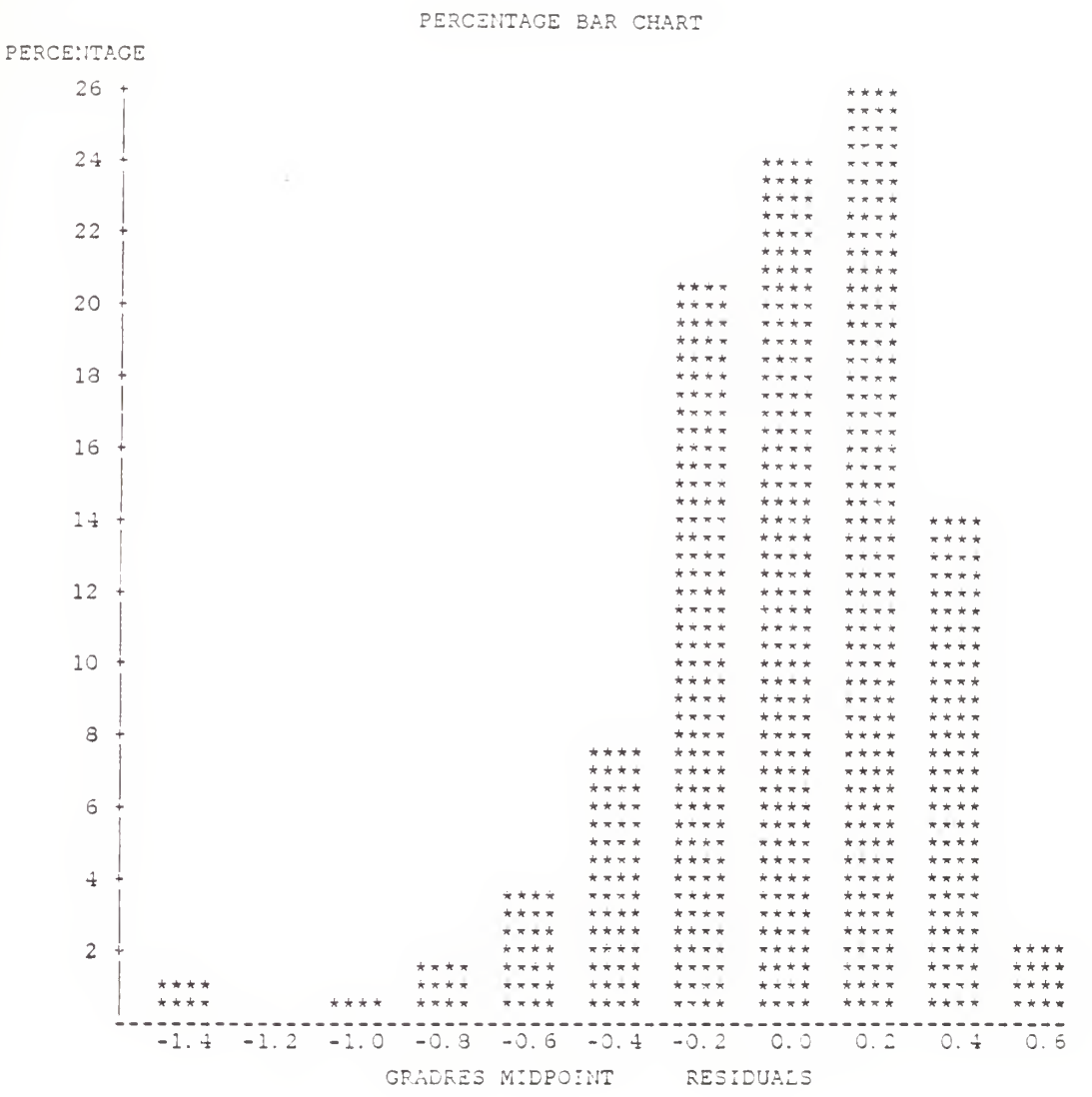

Figure A3. Histogram of Residuals for Regression of GRADGPA on APC's and AGE.

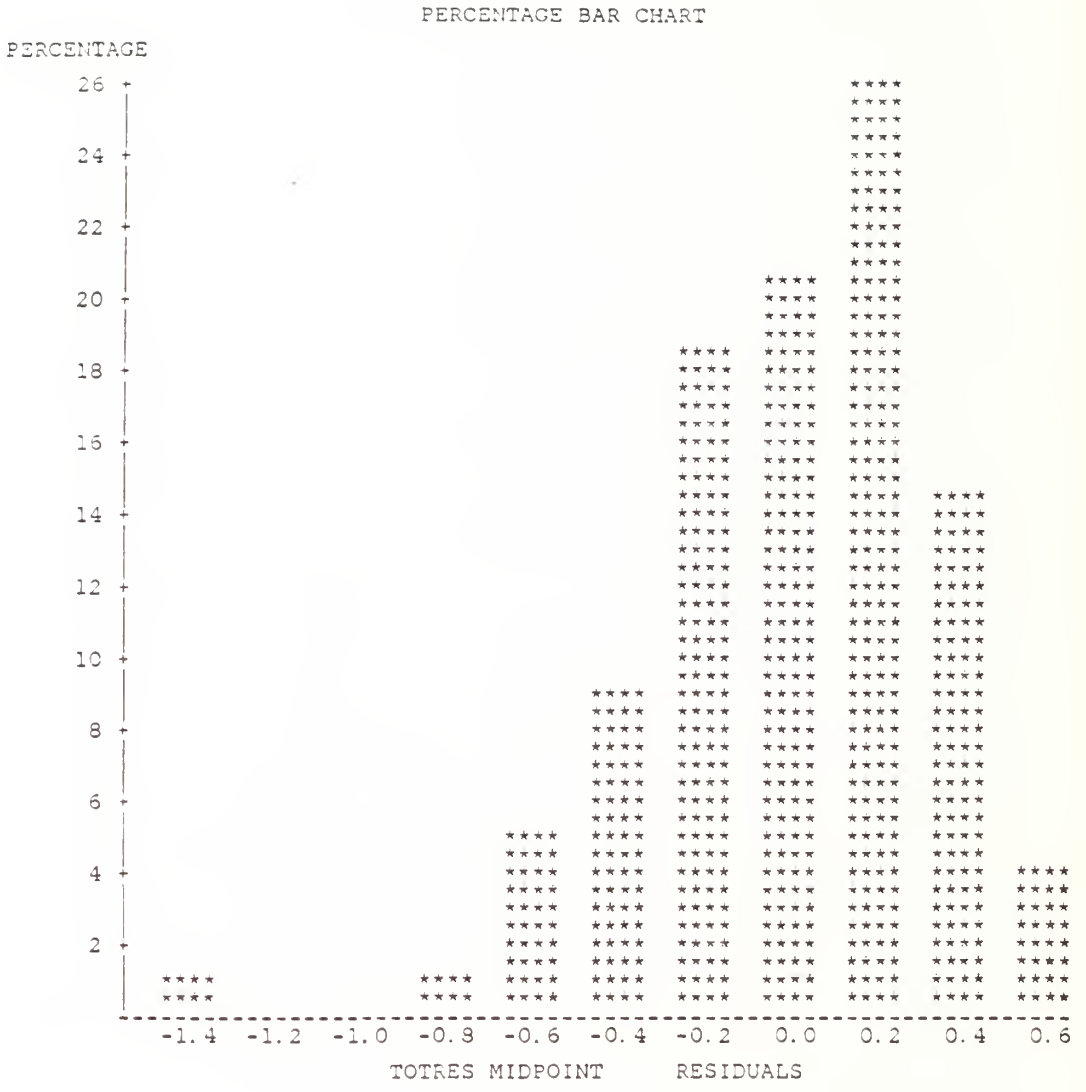

Figure A4. Histogram of Residuals for Regression of TOTGPA ON APC's and AGE.

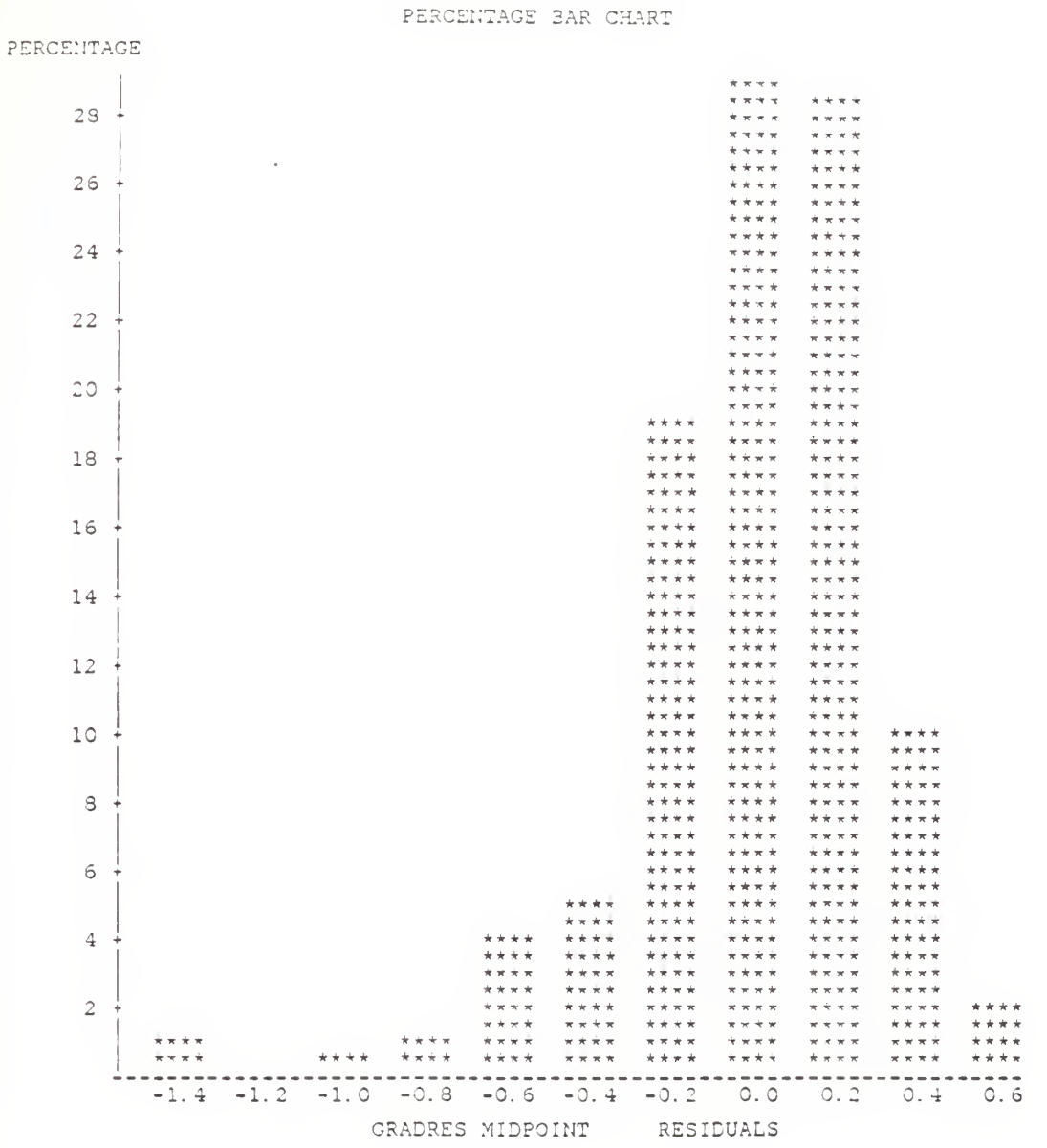

Figure A5. Histogram of Residuals for Regression of GRADGPA on all Carriers.

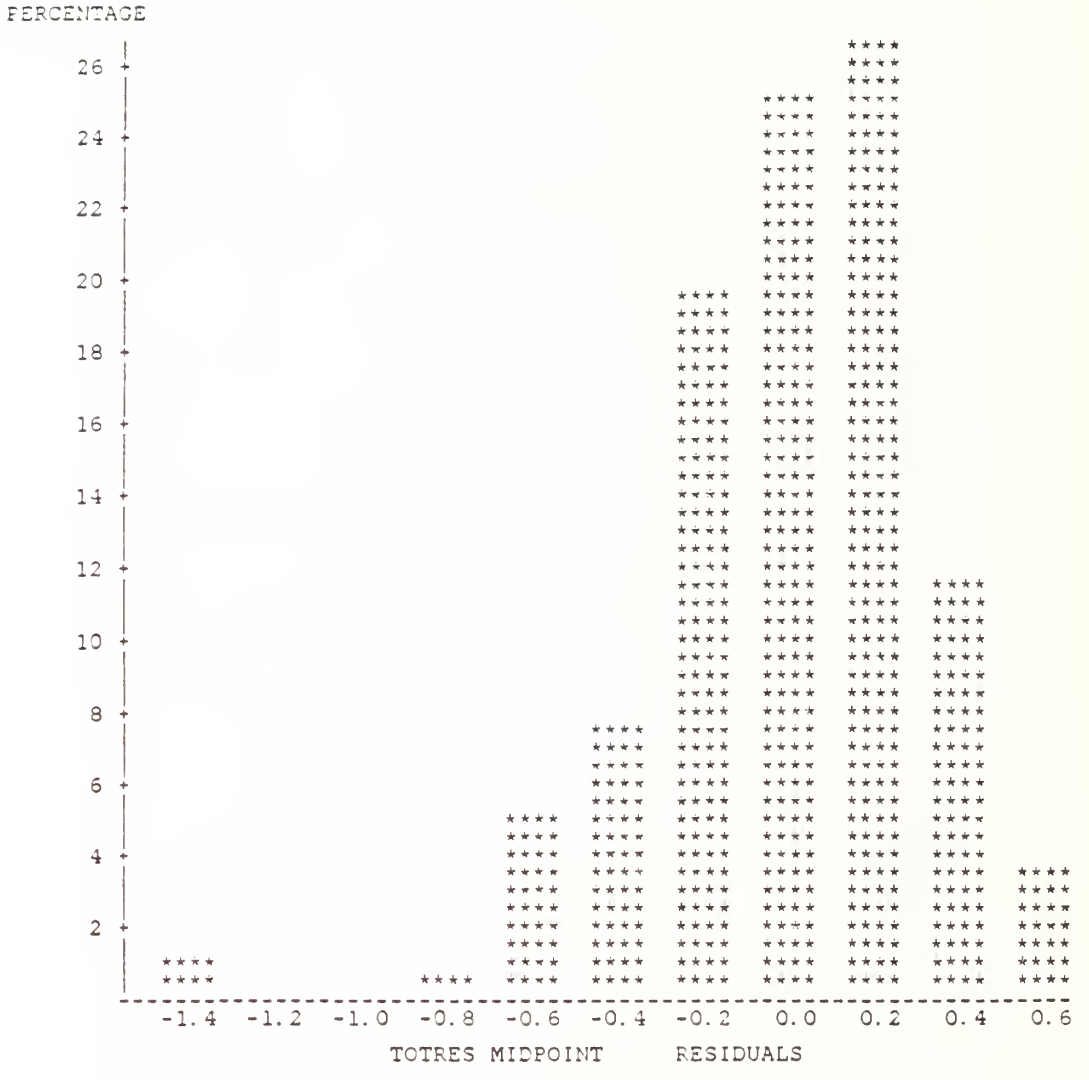

Figure A6. Histogram of Residuals for Regression of TOTGPA on all Carriers.

TABLE A1
CORRELATIONS AMONG VARIABLES IN THE STUDY

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO: RHO=0
/ NUMBER OF OBSERVATIONS

	VERBAL	QUANT	ANAL	APC1	APC2	APC3	AGE	DEGYRS
VERBAL	1.00000 0.0000 317	0.28349 0.0001 317	0.47351 0.0001 317	-0.20547 0.0002 317	-0.01006 0.8584 317	-0.04425 0.4324 317	-0.01955 0.7296 315	0.05980 0.2908 314
QUANT	0.28349 0.0001 317	1.00000 0.0000 317	0.57511 0.0001 317	-0.20687 0.0002 317	-0.38089 0.0001 317	-0.49173 0.0001 317	-0.23621 0.0001 315	-0.16761 0.0029 314
ANAL	0.47351 0.0001 317	0.57511 0.0001 317	1.00000 0.0000 317	-0.19740 0.0004 317	-0.13333 0.0175 317	-0.22880 0.0001 317	-0.26280 0.0001 315	-0.19012 0.0007 314
APC1	-0.20547 0.0002 317	-0.20687 0.0002 317	-0.19740 0.0004 317	1.00000 0.0000 317	0.15250 0.0065 317	0.09900 0.0784 317	0.02005 0.7229 315	0.02392 0.6728 314
APC2	-0.01006 0.8584 317	-0.38089 0.0001 317	-0.13333 0.0175 317	0.15250 0.0065 317	1.00000 0.0000 317	0.53460 0.0001 317	0.25036 0.0001 315	0.21384 0.0001 314
APC3	-0.04425 0.4324 317	-0.49173 0.0001 317	-0.22880 0.0001 317	0.09900 0.0784 317	0.53460 0.0001 317	1.00000 0.0000 317	0.18381 0.0010 315	0.16332 0.0037 314
AGE	-0.01955 0.7296 315	-0.23621 0.0001 315	-0.26280 0.0001 315	0.02005 0.7229 315	0.25036 0.0001 315	0.18381 0.0010 315	1.00000 0.0000 315	0.73917 0.0001 312
DEGYRS	0.05980 0.2908 314	-0.16761 0.0029 314	-0.19012 0.0007 314	0.02392 0.6728 314	0.21384 0.0001 314	0.16332 0.0037 314	0.73917 0.0001 312	1.00000 0.0000 314
GRADGPA	0.28187 0.0001 317	0.39485 0.0001 317	0.34196 0.0001 317	-0.28172 0.0001 317	-0.15206 0.0067 317	-0.19275 0.0006 317	-0.25743 0.0001 315	-0.12952 0.0217 314
TOTGPA	0.31465 0.0001 317	0.31779 0.0001 317	0.35104 0.0001 317	-0.28796 0.0001 317	-0.12373 0.0276 317	-0.14868 0.0080 317	-0.11428 0.0427 315	-0.03392 0.5493 314

	GRADGPA	TOTGPA

CORRELATION COEFFICIENTS / PROB > |R| UNDER HO: RHO=0
/ NUMBER OF OBSERVATIONS

	GRADGPA	TOTGPA
VERBAL	0.28187 0.0001 317	0.31465 0.0001 317
QUANT	0.39485 0.0001 317	0.31779 0.0001 317
ANAL	0.34196 0.0001 317	0.35104 0.0001 317
APC1	-0.28172 0.0001 317	-0.28796 0.0001 317
APC2	-0.15206 0.0067 317	-0.12373 0.0276 317
APC3	-0.19275 0.0006 317	-0.14868 0.0080 317
AGE	-0.25743 0.0001 315	-0.11428 0.0427 315
DEGYRS	-0.12952 0.0217 314	-0.03392 0.5493 314
GRADGPA	1.00000 0.0000 317	0.71450 0.0001 317
TOTGPA	0.71450 0.0001 317	1.00000 0.0000 317

TABLE A2
OUTPUT FROM REGRESSIONS
(CASES 4a-4f AS SHOWN IN TABLE 2)

DEP VARIABLE: GRADGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	5	8.050536	1.610107	18.127	0.0001
ERROR	306	27.180612	0.088826		
C TOTAL	311	35.231149			

ROOT MSE	0.298036	R-SQUARE	0.2285
DEP MEAN	3.452436	ADJ R-SQ	0.2159
C.V.	8.632633		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > |T|
INTERCEP	1	2.795013	0.263719	10.598	0.0001
VERBAL	1	0.00069973335	0.00021238045	3.288	0.0011
QUANT	1	0.0010003323	0.000242187	4.143	0.0001
ANAL	1	0.00030222753	0.00023884926	1.267	0.2060
AGE	1	-0.019062	0.007481135	-2.548	0.0113
DEGYRS	1	0.007499623	0.008593153	0.873	0.3835

DEP VARIABLE: TOTGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	5	7.776952	1.555390	12.939	0.0001
ERROR	306	36.783206	0.120207		
C TOTAL	311	44.560159			

ROOT MSE	0.346708	R-SQUARE	0.1745
DEP MEAN	3.440673	ADJ R-SQ	0.1610
C.V.	10.07675		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > |T|
INTERCEP	1	2.376056	0.306786	7.745	0.0001
VERBAL	1	0.00081116742	0.00024755574	3.279	0.0012
QUANT	1	0.0006691161	0.00028217384	2.446	0.0150
ANAL	1	0.0006342365	0.00027744407	2.286	0.0229
AGE	1	-0.008517756	0.008703124	-0.979	0.3285
DEGYRS	1	0.009416823	0.009996494	0.942	0.3469

DEP VARIABLE: GRADGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	5	5.371714	1.074343	11.010	0.0001
ERROR	306	29.859434	0.097580		
C TOTAL	311	35.231149			

ROOT MSE	0.312378	R-SQUARE	0.1525
DEP MEAN	3.452436	ADJ R-SQ	0.1386
C.V.	9.048039		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > |T|
INTERCEP	1	4.540814	0.200048	22.699	0.0001
APC1	1	-0.100673	0.020061	-5.018	0.0001
APC2	1	0.006766214	0.018038	0.375	0.7078
APC3	1	-0.029983	0.013219	-2.267	0.0241
AGE	1	-0.029066	0.007772591	-3.740	0.0002
DEGYRS	1	0.013514	0.008955563	1.509	0.1323

TABLE A2
OUTPUT FROM REGRESSIONS
(CASES 4a-4f AS SHOWN IN TABLE 2)
CONT'D

DEP VARIABLE: TOTGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	5	4.974101	0.994820	7.690	0.0001
ERROR	306	39.586059	0.129366		
C TOTAL	311	44.560159			

ROOT MSE	0.359675	R-SQUARE	0.1116
DEP MEAN	3.440673	ADJ R-SQ	0.0971
C.V.	10.45363		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|
INTERCEP	1	4.240748	0.230338	18.411	0.0001
APC1	1	-0.119472	0.023069	-5.178	0.0001
APC2	1	-0.001498896	0.0020769	-0.675	0.9462
APC3	1	-0.022605	0.015220	-1.485	0.1385
AGE	1	-0.018865	0.0038949446	-2.360	0.0188
DEGYRS	1	0.016017	0.010312	1.525	0.1139

DEP VARIABLE: GRADGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	8	9.189180	1.148522	13.363	0.0001
ERROR	303	26.042969	0.085950		
C TOTAL	311	35.231149			

ROOT MSE	0.293173	R-SQUARE	0.2608
DEP MEAN	3.452436	ADJ R-SQ	0.2413
C.V.	8.491772		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|
INTERCEP	1	3.134127	0.286719	10.931	0.0001
VERBAL	1	0.000606787884	0.0002115673	2.878	0.0043
QUANT	1	0.000886541147	0.0002700153	3.314	0.0010
ANAL	1	0.000252683763	0.0002364585	1.069	0.2864
APC1	1	-0.070244	0.019397	-3.621	0.0003
APC2	1	0.00958557	0.017152	0.559	0.5764
APC3	1	-0.005899006	0.013371	-0.440	0.6599
AGE	1	-0.021260	0.007428705	-2.862	0.0045
DEGYRS	1	0.009000207	0.0084711198	1.063	0.2888

DEP VARIABLE: TOTGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	8	9.518929	1.189866	10.289	0.0001
ERROR	303	35.041230	0.115648		
C TOTAL	311	44.560159			

ROOT MSE	0.340070	R-SQUARE	0.2136
DEP MEAN	3.440673	ADJ R-SQ	0.1929
C.V.	9.883823		

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|
INTERCEP	1	2.796499	0.332583	8.408	0.0001
VERBAL	1	0.00070337759	0.00024541O4	2.866	0.0044
QUANT	1	0.00051844486	0.00031344	1.654	0.0992
ANAL	1	0.0005939925	0.0002742786	2.165	0.0311
APC1	1	-0.0857744	0.022499	-3.811	0.0002
APC2	1	-0.003519909	0.019895	-0.177	0.8597
APC3	1	-0.002220226	0.015513	-0.143	0.8872
AGE	1	-0.0105520	0.0086170O9	-1.221	0.2231
DEGYRS	1	0.011490	0.0098262S2	1.169	0.2432

TABLE A3
STEPWISE REGRESSIONS FOR TOTGPA AND GRADGPA, OVER ALL DATA

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 4 VARIABLE VERBAL ENTERED R SQUARE = 0.25631704
C(P) = 2.76364872

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	9.78409770	2.44602442	26.78	0.0001
ERROR	310	28.31344389	0.09133369		
TOTAL	314	38.09754159			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.17935904				
VERBAL	0.00064981	0.00019726	0.99116707	10.85	0.0011
QUANT	0.00105222	0.00021508	2.18597894	23.93	0.0001
APC1	-0.07622085	0.01966267	1.37244038	15.03	0.0001
AGE	-0.01910310	0.00511360	1.27463287	13.96	0.0002

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 4 VARIABLE QUANT ENTERED R SQUARE = 0.21290895
C(P) = 2.56556353

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	9.56452473	2.39113118	20.96	0.0001
ERROR	310	35.35954956	0.11405984		
TOTAL	314	44.92307429			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	2.48298434				
VERBAL	0.00070502	0.00023894	0.99305577	8.71	0.0034
QUANT	0.00060980	0.00027168	0.57463361	5.04	0.0255
ANAL	0.00059939	0.00026388	0.58848315	5.16	0.0238
APC1	-0.08566403	0.02198605	1.73155118	15.18	0.0001

TABLE A4
ANALYSIS OF COVARIANCE FOR GRADGPA AND TOTGPA WITH THE FACTOR CURRICULUM

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: GRADGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	40	15.77275347	0.39431884	5.49
ERROR	271	19.45839525	0.07180220	PR > F
CORRECTED TOTAL	311	35.23114872		0.0001

R-SQUARE	C.V.	ROOT MSE	GRADGPA MEAN
0.447693	7.7615	0.26795932	3.45243590

SOURCE	DF	TYPE III SS	F VALUE	PR > F
CURRIC	32	6.58457396	2.87	0.0001
VERBAL	1	0.50819020	7.08	0.0083
QUANT	1	1.11620142	15.55	0.0001
ANAL	1	0.07758183	1.08	0.2995
APC1	1	0.98610931	13.73	0.0003
APC2	1	0.04126429	0.57	0.4491
APC3	1	0.06550473	0.91	0.3404
AGE	1	1.00615472	14.01	0.0002
DEGYRS	1	0.11306691	1.57	0.2106

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: TOTGPA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	40	16.41456443	0.41036411	3.95
ERROR	271	28.14559422	0.10385828	PR > F
CORRECTED TOTAL	311	44.56015865		0.0001

R-SQUARE	C.V.	ROOT MSE	TOTGPA MEAN
0.368369	9.3665	0.32227051	3.44067308

SOURCE	DF	TYPE III SS	F VALUE	PR > F
CURRIC	32	6.89563555	2.07	0.0010
VERBAL	1	0.52169245	5.02	0.0258
QUANT	1	0.91085580	8.77	0.0033
ANAL	1	0.32145398	3.10	0.0797
APC1	1	1.27578497	12.28	0.0005
APC2	1	0.25598821	2.46	0.1176
APC3	1	0.03481506	0.34	0.5631
AGE	1	0.34192250	3.29	0.0707
DEGYRS	1	0.15218884	1.47	0.2271

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10

CURRIC=360

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE VERBAL ENTERED R SQUARE = 0.51233932
C(P) = 2.74972449

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	1.15810000	0.57905000	11.56	0.0004
ERROR	22	1.10231600	0.05010527		
TOTAL	24	2.26041600			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.60146116				
VERBAL	0.00134655	0.00049145	0.37616281	7.51	0.0120
QUANT	0.00172545	0.00054058	0.51047467	10.19	0.0042

CURRIC=360

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 3 VARIABLE APC2 ENTERED R SQUARE = 0.38430014
C(P) = 1.92190744

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	4.82701882	1.60900627	4.37	0.0154
ERROR	21	7.73352518	0.36826310		
TOTAL	24	12.56054400			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	0.53079240				
VERBAL	0.00269668	0.00136746	1.43213535	3.89	0.0619
QUANT	0.00271046	0.00151353	1.18102273	3.21	0.0877
APC2	-0.26196103	0.15435590	1.06068178	2.88	0.1044

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURR=366
GRADGPA

STEP 4 VARIABLE VERBAL ENTERED R SQUARE = 0.78449481
C(P) = 3.80825054

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	2.87567848	0.71891962	10.01	0.0011
ERROR	11	0.78996527	0.07181502		
TOTAL	15	3.66564375			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	4.13939979				
VERBAL	-0.00168452	0.00094223	0.22953927	3.20	0.1014
QUANT	0.00441687	0.00142678	0.68822682	9.58	0.0102
APC1	-0.22838922	0.09226347	0.44005498	6.13	0.0308
AGE	-0.07238691	0.02098239	0.85472289	11.90	0.0054

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURRIC=366

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 1 VARIABLE QUANT ENTERED R SQUARE = 0.55739769
C(P) = -2.62124178

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	0.58526409	0.58526409	17.63	0.0009
ERROR	14	0.46472966	0.03319498		
TOTAL	15	1.04999375			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.40763798				
QUANT	0.00306271	0.00072940	0.58526409	17.63	0.0009

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10
CONT'D

CURRIC=367

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE QUANT ENTERED R SQUARE = 0.20974100
C(P) = -0.42038355

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.60899619	0.30449809	3.18	0.0593
ERROR	24	2.29456678	0.09560695		
TOTAL	26	2.90356296			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.19950520				
QUANT	0.00112447	0.00069301	0.25171054	2.63	0.1177
APC2	-0.14167935	0.07967534	0.30231155	3.16	0.0880

CURRIC=367

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 2 VARIABLE AGE ENTERED R SQUARE = 0.22342964
C(P) = 0.10636571

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.43261605	0.21630803	3.45	0.0481
ERROR	24	1.50363580	0.06265149		
TOTAL	26	1.93625185			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.60105032				
VERBAL	0.00136135	0.00060631	0.31585644	5.04	0.0342
AGE	-0.02496323	0.01378649	0.20541204	3.28	0.0827

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

STEP 2 VARIABLE VERBAL ENTERED R SQUARE = 0.74016276
C(P) = -0.24186727

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.77175714	0.38587857	15.67	0.0006
ERROR	11	0.27092957	0.02462987		
TOTAL	13	1.04268671			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.08176970				
VERBAL	0.00158904	0.00053247	0.21934684	8.91	0.0124
APC3	-0.09854337	0.02595483	0.35504262	14.42	0.0030

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURRIC=368

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 2 VARIABLE VERBAL ENTERED R SQUARE = 0.60777981
C(P) = -1.05843411

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.99309485	0.49654743	8.52	0.0058
ERROR	11	0.64087658	0.05826151		
TOTAL	13	1.63397143			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.04128748				
VERBAL	0.00169737	0.00081895	0.25027497	4.30	0.0625
APC3	-0.11611348	0.03991885	0.49293644	8.46	0.0142

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10
CONT'D

CURRIC=373

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE QUANT ENTERED R SQUARE = 0.69527182
C(P) = -1.20137385

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.79728424	0.39864212	11.41	0.0026
ERROR	10	0.34943884	0.03494388		
TOTAL	12	1.14672308			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.64172311				
QUANT	-0.00294669	0.00102706	0.28763773	8.23	0.0167
ANAL	0.00284530	0.00059990	0.78607773	22.50	0.0008

CURRIC=373

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 2 VARIABLE QUANT ENTERED R SQUARE = 0.55737834
C(P) = -0.69581073

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.42578560	0.21289280	6.30	0.0170
ERROR	10	0.33812209	0.03381221		
TOTAL	12	0.76390769			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.71088287				
QUANT	-0.00233103	0.00101029	0.17999963	5.32	0.0437
ANAL	0.00209086	0.00059011	0.42448449	12.55	0.0053

CURRIC=525

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 1 VARIABLE APC1 ENTERED R SQUARE = 0.45445362
C(P) = -0.65274793

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	0.97470000	0.97470000	10.83	0.0059
ERROR	13	1.17007333	0.09000564		
TOTAL	14	2.14477333			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.99466667				
APC1	-0.28500000	0.08660525	0.97470000	10.83	0.0059

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CURRIC=525

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 1 VARIABLE APC1 ENTERED R SQUARE = 0.46672541
C(P) = -0.27545354

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	0.56767500	0.56767500	11.38	0.0050
ERROR	13	0.64861833	0.04989372		
TOTAL	14	1.21629333			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.98566667				
APC1	-0.21750000	0.06448108	0.56767500	11.38	0.0050

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10
CONT'D

CURRIC=530

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE QUANT ENTERED R SQUARE = 0.50786274
C(P) = 5.36183553

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	1.54920991	0.77460495	10.84	0.0006
ERROR	21	1.50124009	0.07148762		
TOTAL	23	3.05045000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.41753740				
QUANT	0.00257687	0.00081766	0.71001498	9.93	0.0048
AGE	-0.05657275	0.01715376	0.77754706	10.88	0.0034

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURRIC=530

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 3 VARIABLE APC1 ENTERED R SQUARE = 0.64018930
C(P) = 3.66586200

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	2.39718617	0.79906206	11.86	0.0001
ERROR	20	1.34730966	0.06736548		
TOTAL	23	3.74449583			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.10014723				
QUANT	0.00383125	0.00086243	1.32944280	19.73	0.0003
APC1	0.18990759	0.07111000	0.48046392	7.13	0.0147
APC2	-0.34849108	0.07711170	1.37587908	20.42	0.0002

CURRIC=570

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE APC3 ENTERED R SQUARE = 0.63701889
C(P) = -0.38862313

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	0.86010291	0.43005145	15.79	0.0001
ERROR	18	0.49009709	0.02722762		
TOTAL	20	1.35020000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	2.09410320				
QUANT	0.00232472	0.00049568	0.59889814	22.00	0.0002
APC3	-0.05873629	0.03162530	0.09391897	3.45	0.0797

CURRIC=570

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

WARNING: 1 OBSERVATIONS DELETED DUE TO MISSING VALUES.

STEP 1 VARIABLE QUANT ENTERED R SQUARE = 0.37932039
C(P) = -2.56070676

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	0.88529406	0.88529406	11.61	0.0030
ERROR	19	1.44860118	0.07624217		
TOTAL	20	2.33389524			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.71884485				
QUANT	0.00274073	0.00080430	0.88529406	11.61	0.0030

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10
CONT'D

CURRIC=590

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 2 VARIABLE APC1 ENTERED R SQUARE = 0.59503953
C(P) = 0.53332517

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	2	1.10865384	0.55432692	8.82	0.0044
ERROR	12	0.75450616	0.06287551		
TOTAL	14	1.86316000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	2.35240625				
VERBAL	0.00244926	0.00082628	0.55245055	8.79	0.0118
APC1	-0.15147373	0.07984553	0.22628458	3.60	0.0821

CURRIC=590

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 3 VARIABLE ANAL ENTERED R SQUARE = 0.68560367
C(P) = 0.45081963

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	2.02950571	0.67650190	8.00	0.0042
ERROR	11	0.93066762	0.08460615		
TOTAL	14	2.96017333			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	1.59324263				
VERBAL	0.00214141	0.00106885	0.33960307	4.01	0.0704
ANAL	0.00150220	0.00084218	0.26918019	3.18	0.1021
APC1	-0.17692833	0.09375793	0.30128716	3.56	0.0858

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURRIC=620

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

CURRIC=620

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 1 VARIABLE APC1 ENTERED R SQUARE = 0.19055238
C(P) = -1.26725073

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	1	0.19111642	0.19111642	3.06	0.1038
ERROR	13	0.81184358	0.06244951		
TOTAL	14	1.00296000			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	3.62770270				
APC1	-0.09841216	0.05625541	0.19111642	3.06	0.1038

CURRIC=827

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 3 VARIABLE VERBAL ENTERED R SQUARE = 0.67382513
C(P) = 3.21287075

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	0.62738895	0.20912965	6.89	0.0085
ERROR	10	0.30369677	0.03036968		
TOTAL	13	0.93108571			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	0.66795982				
VERBAL	0.00121647	0.00073314	0.08361251	2.75	0.1281
QUANT	0.00236787	0.00070135	0.34616736	11.40	0.0070
APC3	0.16214930	0.07082904	0.15916502	5.24	0.0451

TABLE A5
STEPWISE REGRESSION RESULTS BY CURRICULUM
FOR CASES WITH SAMPLE SIZE AT LEAST 10
CONT'D

CURRIC=827

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 3 VARIABLE VERBAL ENTERED R SQUARE = 0.67781922
C(P) = 2.07924798

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	0.57522160	0.19174053	7.01	0.0080
ERROR	10	0.27341412	0.02734141		
TOTAL	13	0.84863571			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	0.81605039				
VERBAL	0.00111605	0.00069562	0.07037877	2.57	0.1397
QUANT	0.00231890	0.00066546	0.33199976	12.14	0.0059
APC3	0.14966422	0.06720502	0.13559807	4.96	0.0501

CURRIC=837

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE GRADGPA

STEP 4 VARIABLE AGE ENTERED R SQUARE = 0.81416304
C(P) = 3.58827361

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	0.70016106	0.17504026	13.14	0.0002
ERROR	12	0.15981541	0.01331795		
TOTAL	16	0.85997647			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	2.42873481				
VERBAL	0.00173070	0.00038259	0.27252834	20.46	0.0007
ANAL	0.00110541	0.00043840	0.08467196	6.36	0.0268
APC3	0.04562393	0.01704176	0.09545395	7.17	0.0201
AGE	-0.02141177	0.01171520	0.04448802	3.34	0.0926

CURRIC=837

STEPWISE REGRESSION PROCEDURE FOR DEPENDENT VARIABLE TOTGPA

STEP 4 VARIABLE AGE ENTERED R SQUARE = 0.77505357
C(P) = 2.73750225

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	0.60652045	0.15163011	10.34	0.0007
ERROR	12	0.17603249	0.01466937		
TOTAL	16	0.78255294			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	2.65449873				
APC3	0.04250155	0.01788552	0.08283581	5.65	0.0350
AGE	-0.02356370	0.01229524	0.05387965	3.67	0.0794

NO OTHER VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

TABLE A6
AVERAGES OF CARRIER VARIABLES WITHIN CURRICULA

GENERAL LINEAR MODELS PROCEDURE

MEANS

CURRIC	N	GRADGPA	TOTGPA	VERBAL	QUANT
360	24	3.40291667	3.15291667	518.750000	642.916667
361	6	3.40666667	3.30833333	541.666667	670.000000
365	3	3.39000000	3.59000000	510.000000	603.333333
366	15	3.43133333	3.42866667	586.666667	660.666667
367	27	3.48296296	3.52592593	545.185185	597.407407
368	14	3.67714286	3.64857143	538.571429	661.428571
373	13	3.37538462	3.41615385	505.384615	597.692309
374	6	3.40833333	3.40666667	558.333333	663.333333
460	2	3.23500000	3.20000000	500.000000	670.000000
525	15	3.42466667	3.55066667	568.000000	670.000000
530	24	3.37250000	3.38708333	549.166667	670.416667
531	7	3.59428571	3.37428571	594.285714	690.000000
532	2	3.57500000	3.44000000	510.000000	610.000000
535	3	2.74000000	3.14333333	526.666667	690.000000
570	21	3.53000000	3.52380952	547.142857	658.571429
590	15	3.45400000	3.36466667	569.333333	700.666667
591	5	3.38200000	3.42000000	548.000000	648.000000
595	5	3.30400000	3.19800000	522.000000	626.000000
600	5	3.66800000	3.55000000	506.000000	700.000000
610	9	3.58444444	3.46666667	527.777778	685.555556
611	5	3.43600000	3.35000000	492.000000	678.000000
620	15	3.23400000	3.44400000	556.000000	574.000000
684	2	3.76500000	3.76500000	660.000000	590.000000
685	1	3.89000000	3.89000000	680.000000	620.000000
687	7	3.75571429	3.75428571	598.571429	597.142857
813	4	3.53750000	3.54250000	460.000000	547.500000
814	4	3.41250000	3.42750000	555.000000	530.000000
815	8	3.47375000	3.47000000	547.500000	585.000000
819	1	3.52000000	3.52000000	510.000000	660.000000
825	6	3.44500000	3.50333333	565.000000	653.333333
827	14	3.41714286	3.42785714	550.000000	585.000000
837	17	3.51117647	3.49705882	548.235294	622.352941
847	7	3.36714286	3.36000000	540.000000	552.857143

CURRIC	N	ANAL	APC1	APC2	APC3
360	24	587.916667	2.08333333	2.00000000	3.33333333
361	6	643.333333	1.50000000	1.33333333	1.83333333
365	3	616.666667	2.00000000	2.00000000	4.00000000
366	15	605.333333	1.80000000	2.20000000	3.00000000
367	27	572.592593	2.22222222	2.74074074	4.03703704
368	14	605.000000	1.35714286	1.28571429	2.64285714
373	13	525.384615	2.15384615	2.15384615	2.84615385
374	6	608.333333	1.66666667	1.50000000	2.00000000
460	2	605.000000	1.50000000	2.00000000	3.00000000
525	15	637.333333	2.00000000	1.60000000	2.46666667
530	24	597.500000	2.41666667	2.12500000	2.70833333
531	7	639.571429	2.57142857	1.85714286	2.28571429
532	2	575.000000	2.00000000	1.50000000	2.00000000
535	3	613.333333	1.33333333	1.33333333	1.33333333
570	21	589.047619	1.95238095	1.66666667	1.61904762
590	15	595.333333	1.93333333	1.53333333	1.93333333
591	5	628.000000	1.60000000	1.40000000	2.20000000
595	5	534.000000	2.00000000	2.20000000	4.20000000
600	5	568.000000	2.40000000	1.60000000	2.20000000
610	9	616.666667	1.55555556	2.33333333	2.77777778
611	5	524.000000	1.80000000	2.20000000	2.80000000
620	15	587.333333	1.86666667	2.80000000	4.53333333
684	2	585.000000	1.50000000	3.50000000	4.50000000
685	1	640.000000	2.00000000	3.00000000	4.00000000
687	7	598.571429	2.14285714	4.00000000	3.57142857
813	4	540.000000	2.00000000	2.75000000	4.75000000
814	4	575.000000	1.50000000	3.75000000	5.00000000
815	8	567.500000	1.62500000	2.50000000	4.50000000
819	1	600.000000	2.00000000	3.00000000	4.00000000
825	6	561.666667	2.16666667	3.33333333	3.83333333
827	14	548.571429	2.00000000	3.35714286	4.28571429
837	17	595.882353	1.82352941	2.70588235	3.64705882
847	7	558.571429	2.00000000	3.71428571	4.28571429

TABLE A6
AVERAGES OF CARRIER VARIABLES WITHIN CURRICULA
CONT'D

GENERAL LINEAR MODELS PROCEDURE

MEANS

CURRIC	N	AGE	DEGYRS
360	24	30.9166667	7.9583333
361	6	30.0000000	7.0000000
365	3	29.0000000	6.6666667
366	15	31.0000000	7.8666667
367	27	32.7407407	9.8518519
368	14	31.2142857	7.6428571
373	13	32.9230769	9.0000000
374	6	29.0000000	6.3333333
460	2	30.5000000	8.0000000
525	15	30.8666667	8.0666667
530	24	31.3333333	8.1666667
531	7	29.8571429	6.7142857
532	2	27.5000000	5.0000000
535	3	30.0000000	8.0000000
570	21	32.1428571	8.7619048
590	15	31.4666667	7.7333333
591	5	32.6000000	8.2000000
595	5	31.0000000	7.8000000
600	5	32.2000000	8.6000000
610	9	32.3333333	10.2222222
611	5	32.4000000	9.6000000
620	15	31.5333333	8.4666667
684	2	31.5000000	8.5000000
685	1	27.0000000	6.0000000
687	7	33.1428571	8.8571429
813	4	34.0000000	10.2500000
814	4	34.0000000	9.5000000
815	8	33.1250000	9.7500000
819	1	35.0000000	0.0000000
825	6	32.3333333	8.6666667
827	14	33.2857143	9.9285714
837	17	32.2941176	9.0000000
847	7	31.4285714	8.2857143

TABLE A7
PRINCIPAL COMPONENT ANALYSIS SUMMARY

PRINCIPAL COMPONENT ANALYSIS

314 OBSERVATIONS
7 VARIABLES

SIMPLE STATISTICS

	VERBAL	QUANT	ANAL	APC1	APC2	APC3	DEGYRS
MEAN	545.4459	636.1465	587.9618	1.968153	2.267516	3.133758	8.471338
ST DEV	91.9575	85.6294	95.9715	0.896713	1.187701	1.587071	2.936083

CORRELATIONS

	VERBAL	QUANT	ANAL	APC1	APC2	APC3	DEGYRS
VERBAL	1.0000	0.2873	0.4705	-.2071	-.0146	-.0442	0.0598
QUANT	0.2873	1.0000	0.5765	-.2067	-.3681	-.4882	-.1676
ANAL	0.4705	0.5765	1.0000	-.1964	-.1337	-.2273	-.1901
APC1	-.2071	-.2067	-.1964	1.0000	0.1610	0.1018	0.0239
APC2	-.0146	-.3681	-.1337	0.1610	1.0000	0.5318	0.2138
APC3	-.0442	-.4882	-.2273	0.1018	0.5318	1.0000	0.1633
DEGYRS	0.0598	-.1676	-.1901	0.0239	0.2138	0.1633	1.0000

	EIGENVALUE	DIFFERENCE	PROPORTION	CUMULATIVE
PRIN1	2.487277	1.115870	0.355325	0.355325
PRIN2	1.371407	0.425350	0.195915	0.551241
PRIN3	0.946057	0.078336	0.135151	0.686392
PRIN4	0.867721	0.297548	0.123960	0.810352
PRIN5	0.570173	0.142949	0.081453	0.891805
PRIN6	0.427225	0.097086	0.061032	0.952837
PRIN7	0.330139	.	0.047163	1.000000

EIGENVECTORS

	PRIN1	PRIN2	PRIN3	PRIN4	PRIN5	PRIN6	PRIN7
VERBAL	-.287369	0.596933	0.022572	0.122627	-.666290	-.242920	0.206375
QUANT	-.524953	0.036668	0.045329	0.205079	0.443421	0.173860	0.672397
ANAL	-.453899	0.363178	0.320527	0.078380	0.251307	0.255999	-.651581
APC1	0.247118	-.219290	0.530170	0.755801	-.171061	0.092228	0.027591
APC2	0.383586	0.457410	0.[illegible]47	-.008538	0.496248	-.569817	0.085325
APC3	0.427545	0.392052	0.267272	-.277650	-.056007	0.694619	0.240451
DEGYRS	0.211705	0.315296	-.705918	0.536995	0.165664	0.172005	-.121965

TABLE A8
CANONICAL DISCRIMINANT ANALYSES SUMMARY: (a) GRADIND

CANONICAL DISCRIMINANT ANALYSIS

315 OBSERVATIONS — 314 DF TOTAL
7 VARIABLES — 313 DF WITHIN CLASSES
2 CLASSES — 1 DF BETWEEN CLASSES

CANONICAL CORRELATIONS AND TESTS OF HO: THE CANONICAL CORRELATION IN THE CURRENT ROW AND ALL THAT FOLLOW ARE ZERO

	CANONICAL CORRELATION	ADJUSTED CAN CORR	APPROX STD ERROR	VARIANCE RATIO
1	0.289154575	0.239111494	0.051714859	0.0912

	CANONICAL R-SQUARED	LIKELIHOOD RATIO	F STATISTIC	NUM DF	DEN DF	PROB>F
1	0.083610368	0.916389632	4.0015	7	307	0.0003

CANONICAL DISCRIMINANT ANALYSIS

STANDARDIZED CANONICAL COEFFICIENTS

	CAN1	CAN2
VERBAL	-0.0852	0.2148
QUANT	0.2481	-1.0635
ANAL	0.5573	0.9306
APC1	-0.2089	-0.0943
APC2	-0.0227	-0.0643
APC3	0.4165	-0.0754
AGE	-0.6195	0.3235

RAW CANONICAL COEFFICIENTS

	CAN1	CAN2
VERBAL	-.0009337030	0.0023529979
QUANT	0.0028723495	-.0123122962
ANAL	0.0057900865	0.0096674293
APC1	-.2329397677	-.1051830502
APC2	-.0188151185	-.0532785439
APC3	0.2628231819	-.0475771432
AGE	-.1802053984	0.0940935492

CLASS MEANS ON CANONICAL VARIABLES

GRADIND	CAN1	CAN2
0	-0.9834	0.0000
1	0.0922	0.0000

TABLE A8
CANONICAL DISCRIMINANT ANALYSES SUMMARY: (b) TOTIND

CANONICAL DISCRIMINANT ANALYSIS

315	OBSERVATIONS	314	DF TOTAL
7	VARIABLES	313	DF WITHIN CLASSES
2	CLASSES	1	DF BETWEEN CLASSES

CANONICAL CORRELATIONS AND TESTS OF HO: THE CANONICAL CORRELATION IN THE CURRENT ROW AND ALL THAT FOLLOW ARE ZERO

	CANONICAL CORRELATION	ADJUSTED CAN CORR	APPROX STD ERROR	VARIANCE RATIO
1	0.206060719	0.132380039	0.054037051	0.0443

	CANONICAL R-SQUARED	LIKELIHOOD RATIO	F STATISTIC	NUM DF	DEN DF	PROB>F
1	0.042461020	0.957538980	1.9448	7	307	0.0623

CANONICAL DISCRIMINANT ANALYSIS

STANDARDIZED CANONICAL COEFFICIENTS

	CAN1	CAN2
VERBAL	0.0779	0.7163
QUANT	-0.3077	-0.3032
ANAL	0.8242	0.3149
APC1	-0.5886	0.7452
APC2	0.2318	-0.1406
APC3	-0.0398	-0.0487
AGE	-0.0405	0.0915

RAW CANONICAL COEFFICIENTS

	CAN1	CAN2
VERBAL	0.0008536863	0.0078466654
QUANT	-.0035624075	-.0035109534
ANAL	0.0085662991	0.0032713420
APC1	-.6564593965	0.8310746069
APC2	0.1921560060	-.1165235575
APC3	-.0251397813	-.0307034186
AGE	-.0117775299	0.0266269674

CLASS MEANS ON CANONICAL VARIABLES

TOTIND	CAN1	CAN2
0	-0.7479	0.0000
1	0.0589	0.0000

TABLE A9
MEANS OF CARRIER VARIABLES WITHIN LEVELS
OF INDICATORS OF MARGINAL GPA'S

TOTIND	FREQUENCY	WEIGHT	PROPORTION
0	23	23	0.073718
1	289	289	0.926282

CLASS MEANS

TOTIND	VERBAL	QUANT	ANAL	APC1
0	514.34782609	620.43478261	534.34782609	2.39130435
1	548.89273356	637.40484429	592.42214533	1.92733564

TOTIND	APC2	APC3	AGE	DEGYRS
0	2.17391304	3.17391304	32.08695652	8.08695652
1	2.27335640	3.13840830	31.68512111	8.51557093

GRADIND	FREQUENCY	WEIGHT	PROPORTION
0	26	26	0.083333
1	286	286	0.916667

CLASS MEANS

GRADIND	VERBAL	QUANT	ANAL	APC1
0	518.84615385	594.61538462	516.53846154	2.19230769
1	548.84615385	639.93006993	594.65034965	1.94055944

GRADIND	APC2	APC3	AGE	DEGYRS
0	2.42307692	3.11538462	33.88461538	9.92307692
1	2.25174825	3.14335664	31.51748252	8.35314685

TABLE A10
SUMMARY OF DISCRIMINANT ANALYSIS RESULTS FOR GRADIND

DISCRIMINANT ANALYSIS

GRADIND	FREQUENCY	PRIOR PROBABILITY
0	27	0.20000000
1	288	0.80000000
TOTAL	315	1.00000000

WARNING: 2 OF THE 317 OBSERVATIONS WILL NOT BE INCLUDED IN THE ANALYSIS DUE TO MISSING VALUES.

DISCRIMINANT ANALYSIS PAIRWISE SQUARED GENERALIZED DISTANCES BETWEEN GROUPS

$$D^2(I|J) = (\bar{X}_I - \bar{X}_J)' \, COV^{-1} \, (\bar{X}_I - \bar{X}_J) - 2 \, LN \, PRIOR_J$$

GENERALIZED SQUARED DISTANCE TO GRADIND

FROM GRADIND	0	1
0	3.21887582	1.45923162
1	4.23182034	0.44629710

DISCRIMINANT ANALYSIS LINEAR DISCRIMINANT FUNCTION

$$CONSTANT = -.5 \, \bar{X}_J' \, COV^{-1} \, \bar{X}_J + LN \, PRIOR_J \qquad COEFFICIENT \; VECTOR = COV^{-1} \, \bar{X}_J$$

GRADIND

	0	1
CONSTANT	-114.11843459	-109.87550143
QUANT	0.09193031	0.09239236
ANAL	0.05265565	0.05877090
APGI	5.50267335	5.26903948
AGE	3.83570123	3.65052610

NUMBER OF OBSERVATIONS AND PERCENTS CLASSIFIED INTO GRADIND:

FROM GRADIND	0	1	TOTAL
0	7	20	27
	25.93	74.07	100.00
1	8	280	288
	2.78	97.22	100.00
TOTAL	15	300	315
PERCENT	4.76	95.24	100.00
PRIORS	0.2000	0.8000	

TABLE A11
SUMMARY OF DISCRIMINANT ANALYSIS RESULTS FOR TOTIND

DISCRIMINANT ANALYSIS

TOTIND	FREQUENCY	PRIOR PROBABILITY
0	23	0.20000000
1	292	0.80000000
TOTAL	315	1.00000000

WARNING: 2 OF THE 317 OBSERVATIONS WILL NOT BE INCLUDED IN THE ANALYSIS DUE TO MISSING VALUES.

DISCRIMINANT ANALYSIS PAIRWISE SQUARED GENERALIZED DISTANCES BETWEEN GROUPS

$$D^2(I|J) = (\bar{X}_I - \bar{X}_J)' \ COV^{-1} \ (\bar{X}_I - \bar{X}_J) - 2 \ LN \ PRIOR_J$$

GENERALIZED SQUARED DISTANCE TO TOTIND

FROM TOTIND	0	1
0	3.21887582	1.06842236
1	3.84101108	0.44628710

DISCRIMINANT ANALYSIS LINEAR DISCRIMINANT FUNCTION

$$CONSTANT = -.5 \ \bar{X}_J' \ COV^{-1} \ \bar{X}_J + LN \ PRIOR_J \qquad COEFFICIENT \ VECTOR = COV^{-1} \ \bar{X}_J$$

	TOTIND 0	1
CONSTANT	-110.42891002	-110.00428273
QUANT	0.09544968	0.09188951
ANAL	0.05297106	0.06048667
APGI	5.68465052	5.16838096
AGE	3.63138027	3.63381318

DISCRIMINANT ANALYSIS CLASSIFICATION SUMMARY FOR CALIBRATION DATA: WORK.ONE

GENERALIZED SQUARED DISTANCE FUNCTION:

$$D_J^2(X) = (X-\bar{X}_J)' \ COV^{-1} (X-\bar{X}_J) - 2 \ LN \ PRIOR_J$$

POSTERIOR PROBABILITY OF MEMBERSHIP IN EACH TOTIND:

$$PR(J|X) = EXP(-.5 \ D_J^2(X)) \ / \ \sum_K EXP(-.5 \ D_K^2(X))$$

NUMBER OF OBSERVATIONS AND PERCENTS CLASSIFIED INTO TOTIND:

FROM TOTIND	0	1	TOTAL
0	1 4.35	22 95.65	23 100.00
1	6 2.05	286 97.95	292 100.00
TOTAL	7	308	315
PERCENT	2.22	97.78	100.00
PRIORS	0.2000	0.8000	

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=360						
VERBAL	25	522.80	95.68	340.00	710.00	19.14
QUANT	25	649.20	86.98	520.00	800.00	17.40
ANAL	25	594.00	104.92	380.00	800.00	20.98
APC1	25	2.04	0.98	0.00	4.00	0.20
APC2	25	1.96	0.84	0.00	3.00	0.17
APC3	25	3.28	1.02	1.00	5.00	0.20
AGE	25	30.880	3.00	27.00	37.00	0.60
DEGYRS	24	7.96	2.87	4.00	14.00	0.59
GRADGPA	25	3.43	0.31	2.77	4.00	0.06
TOTGPA	25	3.19	0.72	1.00	4.00	0.14
CURRIC=361						
VERBAL	6	541.67	129.06	330.00	710.00	52.69
QUANT	6	670.00	98.99	550.00	800.00	40.41
ANAL	6	643.33	85.24	550.00	780.00	34.80
APC1	6	1.50	0.55	1.00	2.00	0.22
APC2	6	1.33	1.03	0.00	3.00	0.42
APC3	6	1.83	1.17	0.00	3.00	0.48
AGE	6	30.000	4.05	26.00	37.00	1.65
DEGYRS	6	7.00	3.22	4.00	12.00	1.32
GRADGPA	6	3.41	0.33	3.12	3.92	0.13
TOTGPA	6	3.31	0.36	2.99	3.88	0.15
CURRIC=365						
VERBAL	3	510.00	43.59	460.00	540.00	25.17
QUANT	3	603.33	64.29	530.00	650.00	37.12
ANAL	3	616.67	90.74	520.00	700.00	52.39
APC1	3	2.00	0.00	2.00	2.00	0.00
APC2	3	2.00	1.00	1.00	3.00	0.58
APC3	3	4.00	1.00	3.00	5.00	0.58
AGE	3	29.00	2.00	27.00	31.00	1.15
DEGYRS	3	6.67	2.08	5.00	9.00	1.20
GRADGPA	3	3.39	0.37	3.08	3.80	0.21
TOTGPA	3	3.59	0.27	3.30	3.84	0.16
CURRIC=366						
VERBAL	16	590.63	92.48	420.00	740.00	23.12
QUANT	16	665.63	64.49	570.00	770.00	16.12
ANAL	16	608.75	99.72	430.00	800.00	24.93
APC1	16	1.88	0.96	0.00	3.00	0.24
APC2	16	2.25	0.86	1.00	4.00	0.21
APC3	16	3.00	1.63	0.00	5.00	0.41
AGE	16	31.50	3.52	26.00	39.00	0.88
DEGYRS	15	7.87	2.13	4.00	11.00	0.55
GRADGPA	16	3.33	0.49	1.84	3.83	0.12
TOTGPA	16	3.42	0.26	2.98	3.83	0.07
CURRIC=367						
VERBAL	27	545.19	82.85	400.00	700.00	15.94
QUANT	27	597.41	87.86	440.00	760.00	16.91
ANAL	27	572.59	77.24	410.00	720.00	14.86
APC1	27	2.52	0.75	1.00	4.00	0.14
APC2	27	2.74	0.76	1.00	5.00	0.15
APC3	27	4.04	1.51	0.00	5.00	0.29
AGE	27	32.74	3.64	27.00	40.00	0.70
DEGYRS	27	9.85	3.02	5.00	16.00	0.58
GRADGPA	27	3.48	0.33	2.42	3.82	0.06
TOTGPA	27	3.53	0.27	2.74	3.91	0.05

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=368						
VERBAL	15	525.33	96.35	340.00	670.00	24.88
QUANT	15	658.00	74.37	530.00	800.00	19.20
ANAL	15	601.33	72.10	480.00	720.00	18.62
APC1	15	1.47	1.06	0.00	3.00	0.27
APC2	15	1.40	1.06	0.00	3.00	0.27
APC3	15	2.67	1.68	0.00	5.00	0.43
AGE	14	31.21	3.45	28.00	37.00	0.92
DEGYRS	15	7.60	2.90	5.00	15.00	0.75
GRADGPA	15	3.66	0.29	3.13	4.00	0.07
TOTGPA	15	3.63	0.35	2.70	4.00	0.09
CURRIC=373						
VERBAL	13	505.38	104.45	380.00	780.00	28.97
QUANT	13	597.69	72.70	480.00	710.00	20.16
ANAL	13	525.38	124.47	260.00	730.00	34.52
APC1	13	2.15	0.90	1.00	4.00	0.25
APC2	13	2.15	0.69	1.00	3.00	0.19
APC3	13	2.85	1.28	0.00	5.00	0.36
AGE	13	32.92	3.64	28.00	42.00	1.01
DEGYRS	13	9.00	3.56	5.00	18.00	0.99
GRADGPA	13	3.36	0.31	2.83	3.83	0.09
TOTGPA	13	3.42	0.25	3.07	3.83	0.07
CURRIC=374						
VERBAL	6	558.33	79.60	460.00	700.00	32.50
QUANT	6	663.33	104.43	540.00	800.00	42.64
ANAL	6	608.33	109.07	480.00	750.00	44.53
APC1	6	1.67	0.82	0.00	2.00	0.33
APC2	6	1.50	0.84	0.00	2.00	0.34
APC3	6	2.00	1.26	1.00	4.00	0.52
AGE	6	29.00	1.26	28.00	31.00	0.52
DEGYRS	6	6.33	1.03	5.00	8.00	0.42
GRADGPA	6	3.41	0.45	2.59	3.98	0.18
TOTGPA	6	3.41	0.39	2.76	3.98	0.16
CURRIC=460						
VERBAL	2	500.00	28.28	480.00	520.00	20.00
QUANT	2	670.00	70.71	620.00	720.00	50.00
ANAL	2	605.00	120.21	520.00	690.00	85.00
APC1	2	1.50	0.71	1.00	2.00	0.50
APC2	2	2.00	1.41	1.00	3.00	1.00
APC3	2	3.00	2.83	1.00	5.00	2.00
AGE	2	30.50	4.95	27.00	34.00	3.50
DEGYRS	2	8.00	4.24	5.00	11.00	3.00
GRADGPA	2	3.23	0.43	2.93	3.54	0.30
TOTGPA	2	3.20	0.51	2.84	3.56	0.36
CURRIC=525						
VERBAL	15	568.00	98.21	400.00	710.00	25.36
QUANT	15	670.00	77.37	550.00	800.00	19.98
ANAL	15	637.33	90.67	510.00	800.00	23.41
APC1	15	2.00	0.93	0.00	3.00	0.24
APC2	15	1.60	0.83	0.00	3.00	0.21
APC3	15	2.47	1.13	0.00	4.00	0.29
AGE	15	30.87	3.72	27.00	38.00	0.96
DEGYRS	15	8.07	3.39	4.00	15.00	0.88
GRADGPA	15	3.42	0.39	2.74	3.94	0.10
TOTGPA	15	3.55	0.29	3.08	4.00	0.08

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=530						
VERBAL	24	549.17	83.61	410.00	700.00	17.07
QUANT	24	670.42	68.24	560.00	780.00	13.93
ANAL	24	597.50	72.43	480.00	730.00	14.78
APC1	24	2.42	0.93	0.00	4.00	0.19
APC2	24	2.13	0.80	0.00	3.00	0.16
APC3	24	2.71	1.16	0.00	5.00	0.24
AGE	24	31.33	3.25	27.00	39.00	0.66
DEGYRS	24	8.17	2.53	5.00	12.00	0.52
GRADGPA	24	3.37	0.36	2.46	3.89	0.07
TOTGPA	24	3.39	0.40	2.70	4.00	0.08
CURRIC=531						
VERBAL	7	594.29	94.67	480.00	770.00	35.78
QUANT	7	690.00	60.28	610.00	790.00	22.78
ANAL	7	638.57	115.96	460.00	800.00	43.83
APC1	7	2.57	0.79	2.00	4.00	0.30
APC2	7	1.86	0.69	1.00	3.00	0.26
APC3	7	2.29	1.70	0.00	4.00	0.64
AGE	7	28.86	2.34	27.00	34.00	0.88
DEGYRS	7	6.71	2.43	5.00	12.00	0.92
GRADGPA	7	3.59	0.31	2.98	3.94	0.12
TOTGPA	7	3.37	0.35	3.00	3.95	0.13
CURRIC=532						
VERBAL	2	510.00	141.42	410.00	610.00	100.00
QUANT	2	610.00	0.00	610.00	610.00	0.00
ANAL	2	575.00	49.50	540.00	610.00	35.00
APC1	2	2.00	0.00	2.00	2.00	0.00
APC2	2	1.50	0.71	1.00	2.00	0.50
APC3	2	2.00	1.41	1.00	3.00	1.00
AGE	2	27.50	2.12	26.00	29.00	1.50
DEGYRS	2	5.00	1.41	4.00	6.00	1.00
GRADGPA	2	3.57	0.13	3.48	3.67	0.09
TOTGPA	2	3.44	0.20	3.30	3.58	0.14
CURRIC=535						
VERBAL	3	526.67	115.90	420.00	650.00	66.92
QUANT	3	690.00	36.06	660.00	730.00	20.82
ANAL	3	613.33	80.83	540.00	700.00	46.67
APC1	3	1.33	1.53	0.00	3.00	0.88
APC2	3	1.33	1.15	0.00	2.00	0.67
APC3	3	1.33	1.53	0.00	3.00	0.88
AGE	3	30.00	4.58	26.00	35.00	2.65
DEGYRS	3	8.00	4.58	4.00	13.00	2.65
GRADGPA	3	2.74	0.63	2.02	3.16	0.36
TOTGPA	3	3.14	0.25	3.00	3.43	0.14
CURRIC=570						
VERBAL	22	543.64	103.76	330.00	710.00	22.12
QUANT	22	659.64	74.92	530.00	760.00	15.97
ANAL	22	589.18	118.79	350.00	780.00	25.33
APC1	22	2.00	0.82	0.00	3.00	0.17
APC2	22	1.68	0.78	0.00	3.00	0.17
APC3	22	1.59	1.18	0.00	4.00	0.25
AGE	21	32.14	3.23	26.00	36.00	0.70
DEGYRS	22	8.64	3.27	4.00	14.00	0.70
GRADGPA	22	3.65	0.27	3.14	3.98	0.06
TOTGPA	22	3.55	0.35	2.70	4.00	0.07

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=590						
VERBAL	15	569.33	85.40	460.00	740.00	22.05
QUANT	15	700.67	60.98	540.00	750.00	15.74
ANAL	15	595.33	107.30	400.00	750.00	27.70
APC1	15	1.93	0.88	0.00	3.00	0.23
APC2	15	1.53	0.83	0.00	3.00	0.22
APC3	15	1.93	1.33	0.00	4.00	0.34
AGE	15	31.47	3.96	27.00	39.00	1.02
DEGYRS	15	7.73	2.34	5.00	13.00	0.61
GRADGPA	15	3.45	0.36	2.96	4.00	0.09
TOTGPA	15	3.36	0.46	2.78	4.00	0.12
CURRIC=591						
VERBAL	5	548.00	49.19	470.00	590.00	22.00
QUANT	5	648.00	68.34	540.00	720.00	30.56
ANAL	5	628.00	81.09	540.00	760.00	36.25
APC1	5	1.60	0.55	1.00	2.00	0.24
APC2	5	1.40	1.14	0.00	3.00	0.51
APC3	5	2.20	1.92	0.00	5.00	0.86
AGE	5	32.60	4.04	29.00	39.00	1.81
DEGYRS	5	8.20	2.59	5.00	11.00	1.16
GRADGPA	5	3.38	0.31	2.96	3.67	0.14
TOTGPA	5	3.42	0.31	3.00	3.90	0.14
CURRIC=595						
VERBAL	5	522.00	56.30	440.00	580.00	25.18
QUANT	5	626.00	99.40	490.00	730.00	44.45
ANAL	5	534.00	86.78	450.00	640.00	38.81
APC1	5	2.00	0.71	1.00	3.00	0.32
APC2	5	2.20	0.84	1.00	3.00	0.37
APC3	5	4.20	0.84	3.00	5.00	0.37
AGE	5	31.00	2.35	29.00	35.00	1.05
DEGYRS	5	7.80	0.84	7.00	9.00	0.37
GRADGPA	5	3.30	0.27	2.96	3.66	0.12
TOTGPA	5	3.20	0.35	2.86	3.80	0.16
CURRIC=600						
VERBAL	5	506.00	54.13	460.00	590.00	24.21
QUANT	5	700.00	68.99	620.00	790.00	30.86
ANAL	5	568.00	29.50	520.00	600.00	13.19
APC1	5	2.40	0.55	2.00	3.00	0.24
APC2	5	1.60	0.89	1.00	3.00	0.40
APC3	5	2.20	2.17	0.00	5.00	0.97
AGE	5	32.20	4.49	28.00	39.00	2.01
DEGYRS	5	8.60	1.95	6.00	11.00	0.87
GRADGPA	5	3.67	0.20	3.48	4.00	0.09
TOTGPA	5	3.55	0.42	3.14	4.00	0.19
CURRIC=610						
VERBAL	9	527.78	98.59	400.00	670.00	32.86
QUANT	9	685.56	64.83	590.00	790.00	21.61
ANAL	9	616.67	101.56	450.00	790.00	33.85
APC1	9	1.56	1.24	0.00	3.00	0.41
APC2	9	2.33	2.12	0.00	6.00	0.71
APC3	9	2.78	1.48	1.00	5.00	0.49
AGE	9	35.33	3.24	29.00	38.00	1.08
DEGYRS	9	10.22	3.35	7.00	16.00	1.12
GRADGPA	9	3.58	0.28	3.20	3.96	0.09
TOTGPA	9	3.47	0.43	2.70	3.97	0.14

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=611						
VERBAL	5	492.00	85.56	350.00	570.00	38.26
QUANT	5	678.00	45.50	630.00	750.00	20.35
ANAL	5	524.00	163.65	310.00	700.00	73.18
APC1	5	1.80	0.84	1.00	3.00	0.37
APC2	5	2.20	0.84	1.00	3.00	0.37
APC3	5	2.80	1.64	0.00	4.00	0.73
AGE	5	32.40	3.78	29.00	38.00	1.69
DEGYRS	5	9.60	3.78	7.00	16.00	1.69
GRADGPA	5	3.44	0.28	3.03	3.74	0.13
TOTGPA	5	3.35	0.42	2.70	3.75	0.19
CURRIC=620						
VERBAL	15	556.00	109.88	300.00	700.00	28.11
QUANT	15	574.00	69.57	450.00	670.00	17.96
ANAL	15	587.33	105.73	370.00	760.00	27.30
APC1	15	1.87	1.19	0.00	3.00	0.31
APC2	15	2.60	0.77	0.00	3.00	0.20
APC3	15	4.53	0.74	3.00	5.00	0.19
AGE	15	31.53	3.89	26.00	38.00	1.00
DEGYRS	15	8.47	3.14	4.00	14.00	0.81
GRADGPA	15	3.23	0.49	1.93	3.95	0.13
TOTGPA	15	3.44	0.27	3.01	3.96	0.07
CURRIC=684						
VERBAL	3	636.67	41.63	590.00	670.00	24.04
QUANT	3	560.00	79.37	500.00	650.00	45.83
ANAL	3	590.00	75.50	510.00	660.00	43.59
APC1	3	1.33	0.58	1.00	2.00	0.33
APC2	3	4.33	2.08	2.00	6.00	1.20
APC3	3	4.67	0.58	4.00	5.00	0.33
AGE	3	31.33	0.58	31.00	32.00	0.33
DEGYRS	2	8.50	0.71	8.00	9.00	0.50
GRADGPA	3	3.64	0.25	3.40	3.89	0.14
TOTGPA	3	3.64	0.25	3.40	3.89	0.14
CURRIC=685						
VERBAL	1	680.00	.	680.00	680.00	.
QUANT	1	620.00	.	620.00	620.00	.
ANAL	1	640.00	.	640.00	640.00	.
APC1	1	2.00	.	2.00	2.00	.
APC2	1	3.00	.	3.00	3.00	.
APC3	1	4.00	.	4.00	4.00	.
AGE	1	27.00	.	27.00	27.00	.
DEGYRS	1	6.00	.	6.00	6.00	.
GRADGPA	1	3.89	.	3.89	3.89	.
TOTGPA	1	3.89	.	3.89	3.89	.
CURRIC=687						
VERBAL	7	598.57	61.49	500.00	680.00	23.24
QUANT	7	597.14	93.76	490.00	770.00	35.44
ANAL	7	598.57	110.82	420.00	750.00	41.89
APC1	7	2.14	0.90	1.00	4.00	0.34
APC2	7	4.00	2.31	1.00	6.00	0.87
APC3	7	3.57	1.81	1.00	5.00	0.69
AGE	7	33.14	4.10	28.00	40.00	1.55
DEGYRS	7	8.86	2.79	6.00	13.00	1.06
GRADGPA	7	3.76	0.11	3.61	3.93	0.04
TOTGPA	7	3.75	0.11	3.61	3.93	0.04

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=813						
VERBAL	4	460.00	92.01	360.00	580.00	46.01
QUANT	4	547.50	114.13	410.00	660.00	57.06
ANAL	4	540.00	63.25	460.00	600.00	31.62
APC1	4	2.00	0.82	1.00	3.00	0.41
APC2	4	2.75	1.50	1.00	4.00	0.75
APC3	4	4.75	0.50	4.00	5.00	0.25
AGE	4	34.00	3.46	31.00	37.00	1.73
DEGYRS	4	10.25	2.50	9.00	14.00	1.25
GRADGPA	4	3.54	0.20	3.24	3.70	0.10
TOTGPA	4	3.54	0.21	3.24	3.68	0.10
CURRIC=814						
VERBAL	4	555.00	88.88	460.00	670.00	44.44
QUANT	4	530.00	102.31	440.00	650.00	51.15
ANAL	4	575.00	45.09	510.00	610.00	22.55
APC1	4	1.50	1.00	0.00	2.00	0.50
APC2	4	3.75	1.50	3.00	6.00	0.75
APC3	4	5.00	0.00	5.00	5.00	0.00
AGE	4	34.00	2.58	31.00	37.00	1.29
DEGYRS	4	9.50	2.38	8.00	13.00	1.19
GRADGPA	4	3.41	0.22	3.20	3.70	0.11
TOTGPA	4	3.43	0.20	3.25	3.68	0.10
CURRIC=815						
VERBAL	8	547.50	98.52	430.00	710.00	34.83
QUANT	8	585.00	98.99	460.00	730.00	35.00
ANAL	8	567.50	93.47	460.00	750.00	33.04
APC1	8	1.63	0.74	1.00	3.00	0.26
APC2	8	2.50	0.76	1.00	3.00	0.27
APC3	8	4.50	0.76	3.00	5.00	0.27
AGE	8	33.13	3.44	28.00	38.00	1.22
DEGYRS	8	9.75	2.19	6.00	13.00	0.77
GRADGPA	8	3.47	0.26	3.12	3.93	0.09
TOTGPA	8	3.47	0.25	3.14	3.93	0.09
CURRIC=819						
VERBAL	1	510.00	.	510.00	510.00	.
QUANT	1	660.00	.	660.00	660.00	.
ANAL	1	600.00	.	600.00	600.00	.
APC1	1	2.00	.	2.00	2.00	.
APC2	1	3.00	.	3.00	3.00	.
APC3	1	4.00	.	4.00	4.00	.
AGE	1	35.00	.	35.00	35.00	.
DEGYRS	1	0.00	.	0.00	0.00	.
GRADGPA	1	3.52	.	3.52	3.52	.
TOTGPA	1	3.52	.	3.52	3.52	.
CURRIC=825						
VERBAL	6	565.00	105.40	390.00	710.00	43.03
QUANT	6	653.33	59.55	560.00	750.00	24.31
ANAL	6	581.67	57.07	500.00	640.00	23.30
APC1	6	2.17	0.75	1.00	3.00	0.31
APC2	6	3.33	1.37	2.00	6.00	0.56
APC3	6	3.83	1.60	1.00	5.00	0.65
AGE	6	32.33	4.27	28.00	40.00	1.74
DEGYRS	6	8.67	2.80	6.00	13.00	1.15
GRADGPA	6	3.41	0.51	2.44	3.80	0.21
TOTGPA	6	3.50	0.46	2.60	3.82	0.19

TABLE 12
SUMMARY OF DATA ANALYZED BY CURRICULUM
CONT'D

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
CURRIC=827						
VERBAL	14	550.00	69.17	410.00	680.00	18.49
QUANT	14	585.00	76.64	440.00	710.00	20.48
ANAL	14	548.57	103.76	390.00	730.00	27.73
APC1	14	2.00	0.55	1.00	3.00	0.15
APC2	14	3.36	1.28	1.00	6.00	0.34
APC3	14	4.29	0.73	3.00	5.00	0.19
AGE	14	33.29	3.02	26.00	36.00	0.81
DEGYRS	14	9.93	3.10	4.00	14.00	0.83
GRADGPA	14	3.42	0.27	2.79	3.87	0.07
TOTGPA	14	3.43	0.26	2.89	3.87	0.07
CURRIC=837						
VERBAL	17	548.24	93.02	350.00	670.00	22.56
QUANT	17	622.35	88.57	440.00	750.00	21.48
ANAL	17	595.88	80.47	460.00	800.00	19.52
APC1	17	1.82	1.01	0.00	4.00	0.25
APC2	17	2.71	1.05	1.00	5.00	0.25
APC3	17	3.65	1.90	0.00	5.00	0.46
AGE	17	32.29	2.76	28.00	37.00	0.67
DEGYRS	17	9.00	2.98	4.00	15.00	0.72
GRADGPA	17	3.51	0.23	3.08	3.86	0.06
TOTGPA	17	3.50	0.22	3.06	3.85	0.05
CURRIC=847						
VERBAL	7	540.00	117.62	360.00	630.00	44.45
QUANT	7	552.86	111.91	370.00	660.00	42.30
ANAL	7	568.57	117.96	340.00	670.00	44.58
APC1	7	2.00	1.00	0.00	3.00	0.38
APC2	7	3.71	1.25	2.00	5.00	0.47
APC3	7	4.29	0.76	3.00	5.00	0.29
AGE	7	31.43	2.82	26.00	35.00	1.07
DEGYRS	7	8.29	2.69	4.00	12.00	1.02
GRADGPA	7	3.37	0.31	3.05	3.83	0.12
TOTGPA	7	3.36	0.32	3.02	3.86	0.12

OVERALL CURRICULA

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN
VERBAL	317	546.15	91.84	300.00	780.00	5.16
QUANT	317	636.06	86.12	370.00	800.00	4.84
ANAL	317	588.71	95.98	260.00	800.00	5.39
APC1	317	1.97	0.90	0.00	4.00	0.05
APC2	317	2.28	1.20	0.00	6.00	0.07
APC3	317	3.12	1.58	0.00	5.00	0.09
AGE	315	31.72	3.44	26.00	42.00	0.19
DEGYRS	314	8.47	2.94	0.00	18.00	0.17
GRADGPA	317	3.45	0.35	1.84	4.00	0.02
TOTGPA	317	3.44	0.38	1.00	4.00	0.02

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